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COURSE SPECIFICATION

Cranfield University: Course Specifications
Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

COURSE TITLE: Postgraduate Certificate Defence and Security Export

Date of first publication/latest revision: June 2024

1. What is the course?

Course information

Course Title	Defence and Security Export
Course code	PCDSEPTC, SPDSEPTC
Academic Year	2023/2024
Valid entry routes	PgCert, Short Courses for Credit
Additional exit routes	PgCert
Mode of delivery	Part-time
Location(s)[1] of Study	Cranfield
School(s)	Defence and Security and School of Management
Theme	Defence and Security
Centre	Centre for Defence Management and Leadership
Course Director	Irfan Ansari
Awarding Body	Cranfield University
Is this an AP Contract course?[2]	No
Is this course offered as a Cranfield Mastership?	No
Apprenticeship Standard the course is mapped to	N/A
Is the Degree apprenticeship integrated or non-integrated?	N/A
Is the Mastership offered as an open and/or closed course?	N/A
Teaching Institution	Cranfield University

[1] If any part of this course is delivered at another site, please note which one(s) here
[2] AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Admissions body	Cranfield University
Entry requirements	Standard University Entry Requirements
UK Qualifications Framework Level	QAA FHEQ Level 7
Benchmark Statement(s)	Business and Management
Registration Period(s) available	24 Months: registration extends across two years to allow for flexibility in student study scheduling
Course Start Month(s)	January

Institutions delivering the course

This course is delivered by Cranfield University academics. The research interests and teaching expertise of those from the Centre for Defence Management and Leadership include a range of defence management topics, such as defence exports, export control and compliance and research methodology. Marketing and negotiation skills will be taught by academics from the Department of Marketing at the School of Management, Cranfield campus.

Cranfield University interacts with the following institutions and in the following ways:

There will be contributions from visiting lecturers who are leading practitioners in the field sourced from a range of defence and security sector organisations as appropriate to the course.

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

As this is a new course formal accreditation can only be sought towards the end of the first year of operation with a view to the first cohort of students receiving that accreditation. The University is seeking accreditation from the Chartered Institute of Marketing (CIM). The course is therefore not currently accredited by any external body.

2. What are the aims of the course?

Cranfield University offers this course in order to:

- Provide a qualification, appropriate to defence and security marketing professionals plus industrial, government and military business and export control executives.
- Offer niche, skill-based, modules to defence and security executives and government officials,
- Exploit the enormous global economic and educational opportunities stemming from BREXIT, and the government's contemporary priority on export promotion.

This programme is intended for the following range of students:

- Existing sales, marketing and export control employees in defence, aerospace and security industrial companies
- Armed forces personnel aiming to equip themselves with relevant commercial defence and security expertise, reflected via a respected university postgraduate qualification to enhance career prospects in MoD staff postings and post-service commercial appointments
- Civil service personnel working in export-driven government departments, such as the MoD, UKTI and BEIS.

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

In completing this course, and achieving the associated award, a diligent student should be able to:

ILO 1. Evaluate the conceptual, contextual and policy-relevant backdrop to the field of defence and security marketing, including legal and political considerations, export finance, due diligence and offset requirements and strategic trade and export controls

ILO 2. Examine defence and security marketing data, analyse and interpret country risks and trends, and critically evaluate real and potential business opportunities and threats, linked to appropriate offset strategies, to shape successful marketing campaigns

ILO 3. Apply the skills necessary to undertake successful identification of defence and security market prospects, produce an appropriate marketing plan and pursue the deal through effective negotiation to achieve acceptable contractual outcomes

ILO 4. Analyse the institutional constraints to defence and security trade from both national government legislation and supra-national organisations, such as the EU, UN, Wassenaar Arrangement and the Missile Technology Control Regime (MTCR).

ILO 5. Apply the research and methodological skills acquired to source and analyse the evidence to prove or refute arguments on which policy positions and corporate decision-making are based

4. How is the course taught?

PgCert and short course students will be supported in their learning and personal development through the appointment of academic mentors.

A multi-layered approach to learning is provided, employing formal lectures designed to encourage and provoke student participation. There will also be syndicated discussions leading to group presentations on relevant and applied topics. All modules will provide formative learning activities. An additional important dimension of the learning process will be visiting lectures from expert practitioners possessing substantial experience gained from the various industrial and governmental defence and security marketing domains.

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 7. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. Postgraduate Certificate

The accumulation of 60 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Modules 1-7	60
ELECTIVE MODULES:	
TOTAL:	60

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria
The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of ≥50%;
- An average mark of ≥50% across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee);[3] [4]
- **For Taught Assessments,** the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
  - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of ≥50% across the taught assessments);
  - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
  - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥40 credits, which are not part of the taught assessment average), the pass mark of ≥50% (where they exist);
- **For the thesis,** a mark of ≥50% in order to receive a pass (where it exists).

6. How is the course structured?

Part-time students register for the course in January and are normally expected to complete the course within one year, though flexibility is provided through the students being able to spread their study across the two year registration period. The first residential school covers modules 1 and 2. Module 1 provides the study induction and Module 2 provides the contextual relevance, and therefore both Modules 1 and 2 are pre-requisites for the modules that follow.

Students will be required to attend an opening five-day residential school (to include the SOM induction day and Modules 1 and 2) followed by three three-day and one four day residential schools held between January and September each year. All schools will be located at the Cranfield Campus. The period October - December will be dedicated to the Independent Study Project.

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[3] For students who were registered before 1 August 2015, the requirement to obtain a minimum mark for a taught assessment will not apply for taught assessment taken before 31 August 2015 (unless the assessment was designated as a "key assessment" under the previous Assessment Rules).

[4] Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of <40% (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award (<50%).

7. Course Level Assessment Strategy[5]

The PgCert DSE is designed to have a practical bias, with a student participants targeted on mid-career sales, export and control and compliance defence and aerospace professionals. Learning is expected to occur through class debate via shared experiences. The structure of the programme is meant to be flexible, with busy delegates able to mix and match their module attendance over a two year registration period. Accordingly, only the first module, Legal, Ethical and Political Defence Frameworks, is a prerequisite. The five taught modules are skill based, and cover such topics as Defence Marketing, Negotiations, Defence and Security Offset and Strategic Export Control and Compliance. This Cranfield export-oriented course of study is the only one of its kind in the UK, if not in Europe. All the taught modules have a 2,500 word assignment as the principal summative assessment. The time periods devoted to student research and assignment writing are equi-distant between each of the residential schools, averaging a preparatory time periods of around two months. The assignment topics are framed to have relevance to the host module's subject matter. There are several directed assignment topics, but additionally in one or two of the modules there is a self-select question where students can choose an assignment topic themselves, subject to the caveat that it must fall within the parameters of the module's syllabus. Such topics will need to be cleared by the module manager. The teaching structure of each of the taught modules is informed by the module ILOs. The material is delivered not so much through formal lectures but rather by guided class debate, with the expectation that students will contribute their knowledge and practical experience to question the applicability of accepted theory. Student participation in learning exercises, such as syndicate discussion, student presentation, strategy evaluation, case study analysis, reflective writing, quizzes and technology driven exercises, are integrated into the three-day module residential schools. The cohorts are populated by mature and confident executives, and thus this participatory and interactive process is characterised by high levels of problem-solving, refined organisational and managerial leadership, precise articulation of policy challenges and exceptional communication skills. The taught module topics are interrelated but diverse, and this helps to foster adaptability, flexibility and lateral thinking amongst the students. The module leader is expected to make regular interventions in these formative learning exercises, providing guidance and alternative perspectives. The module leaders are also expected to provide copious, insightful and constructive critical feedback on student summative graded assignment submissions. The sixth module is the Independent Study Project (ISP). This is a 4,000 word report based on a student self-selected topic chosen after consultation with the sponsoring company. It is expected to be a mini-consultancy exercise, researching a topic of professional relevance and applicability to the student's employing institution. While awareness of the appropriate scholarship is important and should be demonstrated in the report, the ISP is not meant to be an academic dissertation. Rather, it should be written as an analytical thought piece focused on a practical problem, leading to policy-related conclusions and recommendations. The ISP is intended to reflect the culmination of learning from the previous five modules. The students will be supported in their research and writing endeavours by a focused research methodology half day session just prior to their engagement on ISP research. This session acts to complement the half-day study skills session the students received as part of their induction during the first residential school.

[5] Guidance to aid colleagues writing or updating a course-level assessment strategy for inclusion in the Course Specification can be found as Appendix K in either the Senate Handbook on Setting up a New Taught Course or the Senate Handbook on Managing Taught Courses https://intranet.cranfield.ac.uk/EducationServices/Pages/SenateHandbooksA-Z.aspx

Course modules

The following modules outline all parts of the programme leading to Postgraduate Certificate. Other awards associated with the course include some or all of these modules.

Module Number	Module code	Title	Module Leader	Contact hours[6]	Total hours delivered by Visiting Lecturers[7]	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[8] - 40% or 50%	Type of Assessment	Weighting within module[9] (%) of Independent assessments	Weighting within module of multi-part assessments[10]	Type of Assessment	Weighting of individual elements of multi-part assessment[11]	Assessment Submission and/or exam date[12]	Assessment / Exam Retake date
1	R-DMR-IS	Introductory Studies A22	Gemma Collantes Celador	7	N/A	0	N	N/A	15/01/24	15/01/24	N/A	AO	N/A				N/A	N/A
2	R-DMR-LEPDSF	Legal, Ethical and Political Defence &	Anicee Van Engeland	16	2	10	Y	16/01/24	16/01/24	17/04/24	40	ICW	100				13/03/24	TBC

[6] Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice
[7] Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)
[8] A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.
[9] For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education
[10] For **multi-part assessments** please record the overall weighting of module which should be 100%. Multipart assessments should only be included in courses where there is a clear androgogical reason and where each element forms part of a continuous learning and assessment experience for students.
[11] Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate*)*. If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.
[12] Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours[6]	Total hours delivered by Visiting Lecturers [7]	Credits	Is the module shared? Y/N	Calendar			Assessment								
												Independent Assessment		Multi-part Assessment			Submission dates		
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[8] - 40% or 50%	Type of Assessment	Weighting within module[9] (%) of Independent assessments	Weighting within module of multi-part assessments	Type of Assessment	Weighting of individual elements of multi-part assessment[11]	Assessment Submission and/or exam date[12]	Assessment / Exam Retake date
		Security Frameworks (incl. SoM induction day) A22																	
3	R-DMR-DSO	Defence and Security Offset	Prof Ron Matthews	16	0	10	N	09/09/24	16/09/24	17/09/24	40	ICW	100				Sept 2024 TBC	TBC	
4	R-DMR-N	Negotiations A22	Dr Robby Allen	16	0	10	Y	11/03/24	18/03/24	19/03/24	40	ICW	100				03/07/24	TBC	
5	MXM/DEF	Defence Export Finance B22	Irfan Ansari	16	0	10	Y	06/05/24	13/05/24	14/05/24	40	ICW	100				11/09/24	TBC	
6	R-DMR-STCC	Strategic Trade Controls and Compliance A23	Peter Jolliffe	16	0	10	Y	01/07/24	08/07/24	09/07/24	40	ICW	100				06/11/24	TBC	
7	R-DMR-ISP	Independent Study Project A23	Gemma Collantes Celador	7 (plus 13 individual supervision)	0	10	N	11/09/24	18/09/24	18/09/24	40	ICW	100				31/01/25	TBC	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Please list all modules that are used by another existing course.

Module code	**Module title**	**Course that owns the module**	**Other course(s)/ programme(s) that use the module**
R-DMR-LEPDSF	Legal, Ethical and Political Defence and Security Frameworks	Defence and Security Export	Executive MBA (Defence Export option) Defence and Security Programme
R-DMR-N	Negotiations	Defence and Security Export	Defence and Security Programme
MXM/DEF	Defence Export Finance	Executive MBA (Defence Export option)	Defence and Security Programme
R-DMR-STCC	Strategic Trade Controls and Compliance	Defence and Security Export	Executive MBA (Defence Export option)

8. How are the ILOs assessed?

The following assessment types are utilised:

1. Individual written assignments, on an applied relevant topic, will all have a targeted length of 2,500 words.

2. In-class group presentations.

3. There will also be an Independent Study Project conducted as a mini consultancy project within the student's company, or, if self-funded, a library-based project. The submitted report will be 4,000 words in length.

This approach has been adopted because:

The appropriate assessment strategy is held to comprise assignments to provide the student body with the opportunity to develop academic writing and research skills in support of the later Independent Study Project, whilst the group presentations are intended to encourage the sharing of ideas, knowledge and relevant practical experiences, developing presentation skills.

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

(Module numbers should correspond with those used in the Course module table above.)

A.

Award ILOs / Module No.	1	2	3	4	5
2	ICW	ICW		ICW	ICW
3		ICW	ICW		
4			ICW	ICW	ICW
5	ICW			ICW	ICW
6	ICW			ICW	ICW
7	ICW		ICW		ICW

9. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who provides authoritative guidance on policy and procedure to the Panel. Proposals are reviewed in line with the UK Quality Code for Higher Education. New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guiding principles to meet the Expectations and Core Practices of the UK Quality Code for Higher Education. External examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.
Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the

University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.

2. A Partnership Delivery Approval Panel then considers whether the proposal meets the UK Quality Code for Higher Education. The delivery of new partnership provision is ultimately approved by the Universities Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

10. What opportunities are graduates likely to have on completing the course?

As this is a new course we cannot give evidence of the employment destinations of recent graduates. However, the PgCert in Defence and Security marketing will be attractive to employers seeking skilled personnel in the sales and marketing arena of defence, aerospace and security organisations. The knowledge and skills acquired on the PgCert will reflect learning in the key areas of marketing management, specifically related to the defence, aerospace and security sectors and as such will be highly attractive to employers.

There are three reasons why career advancement will be strengthened by taking the PgCert. Firstly, it is the only qualification on the market that offers dedicated learning with respect to defence and security marketing. Secondly, the combination of module topics is appropriate to the skill requirements of marketing executives and government officials seeking to specialise in this field. Thirdly, it is the only course that offers tuition and training specifically geared towards defence and security trade control and compliance, representing essential knowledge for those working in this area of endeavour.

COURSE SPECIFICATION

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

Date of first publication/latest revision: June 2024

1. What is the course?

Course information

Course Title,
MSc in Defence and Security (Engineering) MSc in Defence and Security (Leadership and Management) with a pathway option in Leadership and Security MSc in Defence and Security (Technology)
Course code
Defence and Security (Engineering) – MSc, PgDip and PgCert
MSDENPTR, PDDENPTR, PCDENPTR
Defence and Security (Leadership and Management) – MSc, PgDip and PgCert
MSDLEPTR, PDDLEPTR, PCDLEPTR
Defence and Security (Technology) – MSc, PgDip and PgCert
MSDTEPTR, PDDTEPTR, PCDTEPTR
Defence and Security (Leadership and Management)
Leadership and Security pathway– MSc, PgDip and PgCert
MSDLDPTR, PDDLDPTR, PCDLDPTR
Defence and Security (Engineering)
Aero Systems pathway – MSc, PgDip and PgCert– Not open to new entrants
MSDEAPTR, PDDEAPTR, PCDEAPTR
Defence and Security – Short Course for Credit
SPDSPPTR
Capstone route Not available for 2023/2024 **Defence and Security (Engineering) – MSc and PgCert**
MSCDEPTR, PCCDEPTR
Defence and Security (Leadership and Management) – MSc and PgCert
MSCDLPTR, MSCDLPTR MSCDLPTR
Defence and Security (Technology) – MSc and PgCert

MSCDTPTR, PCCDTPTR
Academic Year, 2023-2024
Valid entry routes, MSc, PgDip, PgCert in Defence and Security (Engineering)

MSc, MSc Capstone, PgDip, PgCert in Defence and Security (Leadership and Management)

MSc, MSc Capstone, PgDip, PgCert in Defence and Security (Technology)
Additional exit routes, PgCert (MSc and MSc Capstone route), PgDip (MSc route only)
Mode of delivery, Part-time
Location(s)[1] of Study, Shrivenham or Cranfield and online. The Leadership and Security pathway is delivered fully online
School(s), Cranfield Defence and Security
Theme, Cranfield Defence and Security
Centre, Engineering, Leadership and Management, Leadership and Security and Technology
Programme Director, Sean Price
Course Director, Dr Ifti Zaidi (Leadership and Management stream, Leadership & Security pathway) Dr Tim Ferris (Engineering and Technology streams)
Awarding Body, Cranfield University
Is this an AP Contract course?[2], No
Is this course offered as a Cranfield Mastership?, No
Apprenticeship Standard the course is mapped to, N/A
Is the Degree apprenticeship integrated or non-integrated? N/A
Is the Mastership offered as an open and/or closed course?, N/A

Teaching Institution, Cranfield University
Admissions body, Cranfield University
Entry requirements,
The Standard University Entry Requirements as dictated by the course.

Leadership and Management stream and associated pathway normally requires IELTS 6.5. All other courses and pathways normally require IELTS 7.

UK Qualifications Framework Level, QAA FHEQ level 7 (Masters)
Benchmark Statement(s), N/A
Registration Period(s) available, Part Time: 3 years MSc, 2 years PgDip and PgCert,
Course Start Month(s), September,
Additional intake in April for Leadership and Management (including associated pathways)

Institutions delivering the course

This course is delivered by Cranfield Defence and Security where the research interests include:

Armour systems, CBRN, Counter IED, Computing, Simulation and Modelling, Digital Forensics, Defence Information Systems, Defence Manufacturing, Defence Sensors, Defence Systems Engineering, Test and Evaluation, Defence Training Analysis, Gun Technologies, Vehicle Engineering and Mobility and Weapons Engineering

Cranfield University interacts with the following institutions and in the following ways:

[1] If any part of this course is delivered at another site, please note which one(s) here
[2] AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

- As part of the course is delivered at the Defence Academy, students have access to the facilities onsite and to current serving MOD military and civilian staff.
- Students can arrange to make visits to a number of military venues.
- All of our industrial students are sponsored by their employers, who provide direct support to the course in the form of informal input to theses and provision of information to support coursework and projects

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This course is not accredited by any external bodies.

2. What are the aims of the course?

- Cranfield University offers the above courses with additional pathways to provide flexible education suitable for a range of learners engaged in the complex and evolving defence and security environment.

- It enables tailored learning pathways with choice of electives to meet the demands of learners across their career as well as meeting varying employer requirements.

- All courses and pathways have common core modules providing essential professional competencies. Each course and pathway further provide depth in specialist topics aligned with their relevant range of disciplines

This programme is intended for the following range of students:

- Recent graduates wishing to extend their knowledge and skill within the domains of technology, engineering and leadership and management.
- Experienced and or qualified engineers, scientists, managers or leaders wishing to extend their skills or apply them in new areas

3. Dual Accreditation

The Defence and Security Programme is recognised by City & Guild through the Institute of Leadership and Management (ILM) and carries a professional level 7 accreditation. The additional certification is only available to those students who opt-in and complete the registration process with the Institute of Leadership and Management (ILM). On successful completion of the course, students will receive the award as indicated below:

Exiting with PgCert: ILM Level 7 Award in Leadership and Management.
Exiting with PgDip: ILM Level 7 Certificate in Leadership and Management.
Exiting with MSc: ILM Level 7 Diploma in Leadership and Management.

The accreditation is available to all streams and pathways.

4. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate in Defence and Security (Engineering) including the Aero Systems pathway

Postgraduate Certificate in Defence and Security (Leadership and Management) including the Leadership and Security pathway

Postgraduate Certificate in Defence and Security (Technology)

In completing this course, and achieving the associated award, a diligent student should be able to:

ILO 1. Analyse the principal influences and constraints on the modern Defence and Security environment.
ILO 2. Assess the impact management and leadership approaches have on the success of the Defence and Security enterprise, including resilience to change.
ILO 3. Construct a range of models to support decision making within complex Defence and Security problems at multiple levels of abstraction.
ILO 4. Evaluate the relationship between organisational; behaviour and culture.
ILO 5. Develop Solutions appropriate to Defence and Security as a complex adaptive system.

B. Postgraduate Diploma in Defence and Security (Engineering) including the Aero Systems pathway

C.

In addition to the intended learning outcomes outlined in the Certificate, a diligent student would also be expected to:

ILO 6. Evaluate and apply concepts to a range of defence engineering challenges.
ILO 7. Apply appropriate engineering analysis methods for solving complex defence engineering problems.
ILO 8. Develop innovative designs for defence products, systems, components or processes.
ILO 9. Analyse new and emerging technologies to address current and future defence needs.
ILO 10. Assess the ethical and regulatory requirements of engineering within a defence context.

Postgraduate Diploma in Defence and Security (Leadership and Management) including the Leadership and Security pathway

In addition to the intended learning outcomes outlined in the Certificate, a diligent student would also be expected to:

ILO 11. Evaluate and apply management and leadership concepts to a range of complex Defence and Security challenges.
ILO 12. Apply appropriate analysis methods and tools and techniques for solving complex problems.
ILO 13. Assess risk and uncertainty in complex systems proposing mitigation strategies where possible.
ILO 14. Develop innovative solutions to current and future Defence and Security challenges.

Postgraduate Diploma in Defence and Security (Technology)

In addition to the intended learning outcomes outlined in the Certificate, a diligent student would also be expected to:

ILO 15. Analyse new and emerging technologies to address current and future Defence and Security needs.
ILO 16. Apply a range of models and tools to aid decision making for dynamically complex Defence and Security problems; at multiple levels of abstraction.
ILO 17. Assess risk and uncertainty in complex systems, proposing mitigation strategies where possible.

ILO 18. Develop innovative solutions for Defence and Security products, systems, components or processes.

MSc in Defence and Security (Leadership and Management) including the Leadership and Security pathway

MSc in Defence and Security (Technology)

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

ILO 19. Acquire, organise, discuss and assess knowledge associated with complex Defence and Security problems
ILO 20. Plan, organise and undertake a piece of research with appropriate supervision.
ILO 21. Apply appropriate methods, tools techniques and knowledge to a complex problem.
ILO 22. Gather and critically appraise data, and to utilise it within the appropriate academic and practical context.
ILO 23. Prepare a written submission to effectively communicate findings.

5. How is the course taught?

Students will be supported in their learning and personal development by:

Our education philosophy which is led by the basic principles of:

- Research led teaching through a course team that are active practitioners and researchers
- Technology enhanced learning to maximise the student learning experience
- Learning through a mixture of formative and summative feedback and assessment using a variety of methods

Full use will be made of blended learning, combining independent distance learning material via the VLE with online and onsite contact. A wide variety of remote learning methods and materials will be used across the course. This is structured around a core of recorded lecture material and supporting text, with additional multimedia methods employed to maximise student learning time and approaches. This may include audio podcasts and audio-visual multimedia-based resources such as vodcasts and both internal and externally produces documentaries. Traditional books and academic papers also form a component of the learning approach mix.

Online Quizzes, hosted on the VLE, enable students to test their understanding of the concepts and methods used covered in the modules. Where there are deficiencies, the quiz provides instant feedback and directs the student to the module resources that require further development or improvement to ensure they are best placed for their summative assessment.

Individual and group exercises, face-to-face or online, will allow students to apply specific methods or skills, formative feedback will always be given using a combination of pre-prepared answers, peer review and direct staff feedback. This specific feedback may then be further discussed during asynchronous discussions or synchronous tutorial sessions.

In many modules case studies are used to illustrate practical and domain specific issues as the course progresses. In some cases the case studies integrate across modules in the course. This will allow all students to study the same content and then to apply what they have learned to examples from different application domains

To maximise student support and feedback a number of approaches to student contact and formative feedback will feature heavily across the course:

- Self-paced and live online discussion: To ensure full formative feedback and support, students will have access to VLE hosted discussion forums that will enable peer-to-peer and academic-student discussion, questions and answers about the concepts and approaches to their work. This may include discussion of specific exercises or general student questions

- Live online tutorials: real-time discussions with peers and academics delivered online or face-to-face will allow exchange of ideas, answering of questions and general discussion, providing academics with an ability to provide constructive dialogue with - and to challenge - students.

- Short Residential workshops will bring together group exercises, review of online discussions and face to face tutorials. Longer residential workshops will also form a significant part of the workshop modules.

Dedicated support by Learning Services ensures adoption of consistent online learning design using a robust suite of developed tools and interactions. This is supplemented with an induction and learner support online package focussing on study skills and independent learning.

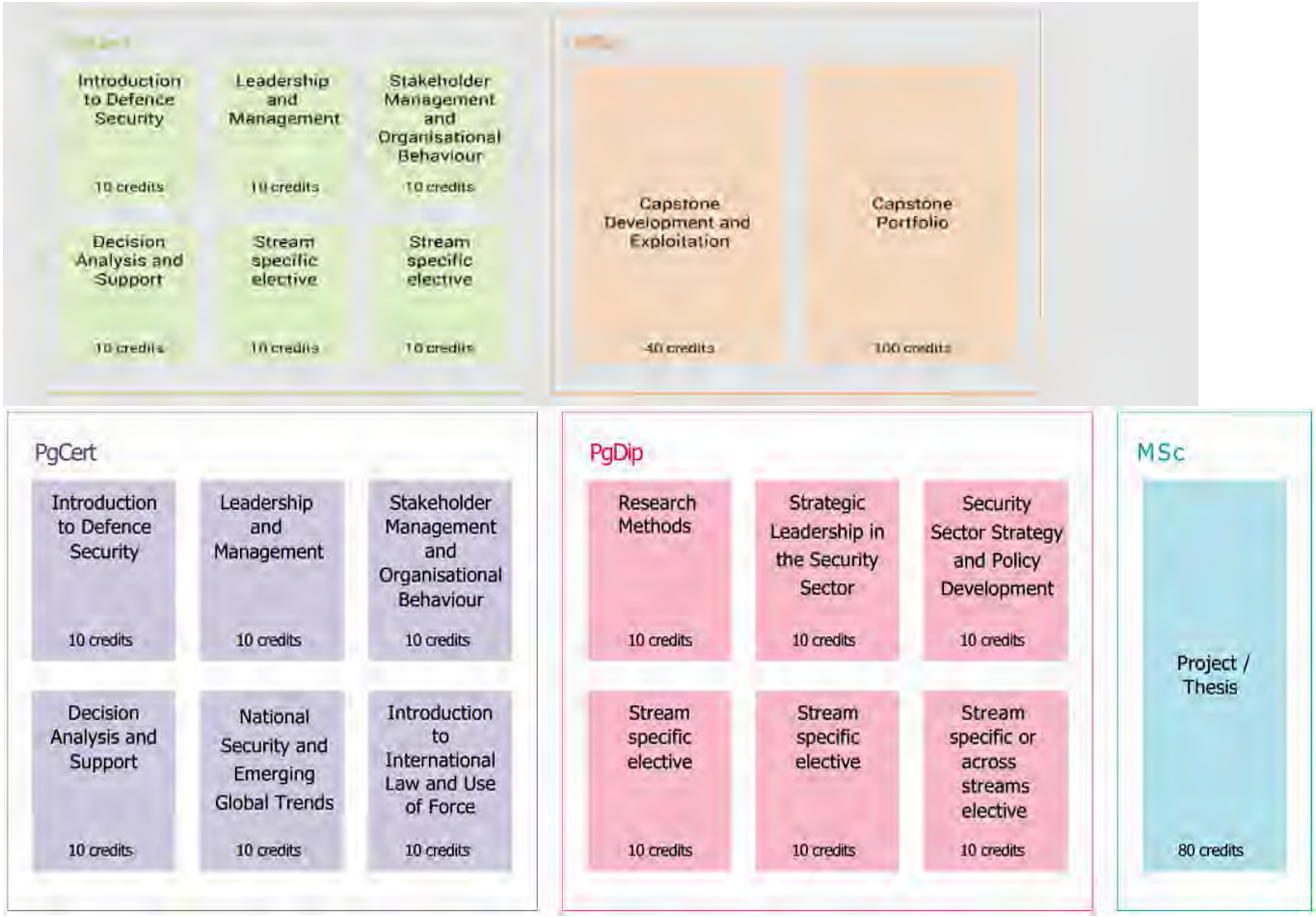
Direct access to the library to supplement the online catalogue and face-to face discussions with staff are all benefits of this blended approach to learning.

In addition, students will be supported in their learning and personal development:

- Access to a Flexible Education Coordinator for pastoral care and to help in navigating and choosing modules to ensure appropriate progression. This will include checks for suitability where learners are taking modules from different streams.

MSc Route (excludes pathways): MSc in Defence and Security (Engineering), MSc in Defence and Security (Leadership and Management), MSc in Defence and Security (Technology)

Capstone Route (excludes pathways): MSc in Defence and Security (Engineering), MSc in Defence and Security (Leadership and Management), MSc in Defence and Security (Technology)

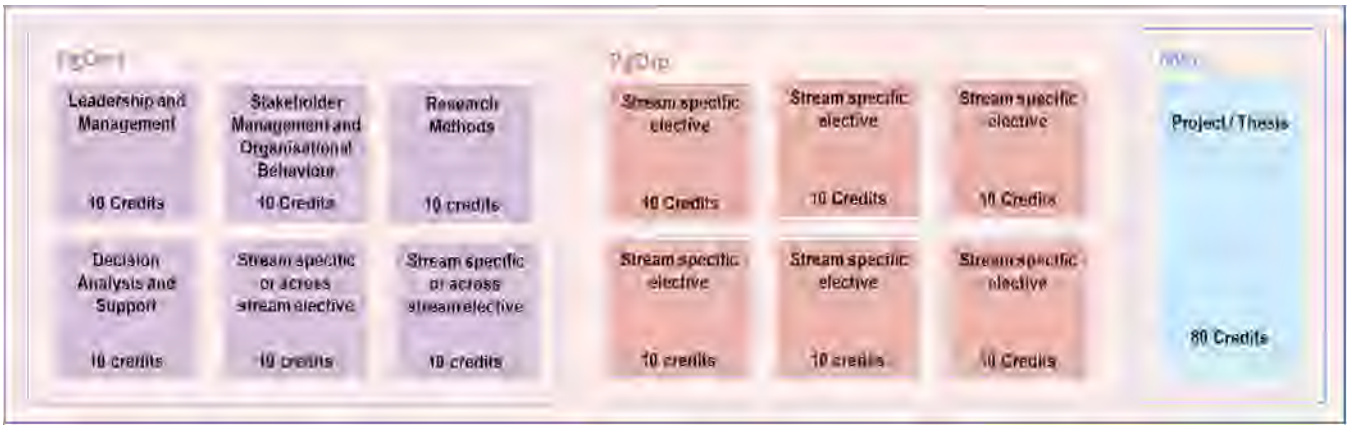


Leadership and Security pathway of the MSc in Defence and Security (Leadership and Management)

Notes:

- *Only fully online across stream elective modules may be taken.*

Aero Systems pathway of the MSc in Defence and Security (Engineering) - for continuing students only



6. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 6. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. Postgraduate Certificate in Defence and Security (Engineering), Defence and Security (Technology), and Defence and Security (Leadership and Management

The accumulation of 60 credits[3] through the assessment of taught modules as detailed below:

Description	**Credits**
COMPULSORY MODULES:	
Induction Introduction to Defence and Security Leadership and Management Decision Analysis and Support Stakeholder Management and Organisational Behaviour	0 10 10 10 10
ELECTIVE MODULES:	
20 credits from the relevant stream Modules Eng: 100 – 199; L&M: 200 – 299; Tech: 300 – 399	20
TOTAL:	**60**

B. Postgraduate Diploma in Defence and Security (Engineering), Defence and Security (Technology) and Defence and Security (Leadership and Management

The accumulation of 120 credits[4] through the assessment of taught modules as detailed below:

Description	**Credits**
COMPULSORY MODULES:	
Induction Introduction to Defence and Security Leadership and Management Decision Analysis and Support Stakeholder Management and Organisational Behaviour Research Methods	0 10 10 10 10 10
ELECTIVE MODULES:	

[3] Senate Regulations require a minimum of 60 learning credits to be accumulated for the Award of PgCert. The number of learning credits for individual courses is set during course validation.
[4] Senate Regulations require a minimum of 120 learning credits to be accumulated for the Award of PgDip. The number of learning credits is set during course validation.

50 credits from the relevant stream (Eng: 100 – 199; L&M: 200 – 299; Tech: 300 – 399) and 20 credits from any stream Modules 100 – 399 (subject to eligibility and module availability)	70
TOTAL:	**120**

C. MSc Taught in Defence and Security (Engineering), Defence and Security (Technology) and Defence and Security (Leadership and Management

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	**Credits**
COMPULSORY MODULES:	
Induction Introduction to Defence and Security Leadership and Management Decision Analysis and Support Stakeholder Management and Organisational Behaviour Research Methods Thesis	0 10 10 10 10 10 80
ELECTIVE MODULES:	
50 credits from the relevant stream (Eng: 100 – 199; L&M: 200 – 299; Tech: 300 – 399) and 20 credits from any stream Modules 100 – 399 (subject to eligibility and module availability)	70
TOTAL:	**200**

D. MSc Capstone in Defence and Security (Engineering), Defence and Security (Leadership and Management) and Defence and Security (Technology)

Description	**Credits**
COMPULSORY MODULES:	
Induction Introduction to Defence and Security Leadership and Management Decision Analysis and Support Stakeholder Management and Organisation Behaviour Capstone Development and Exploitation Capstone Portfolio	0 10 10 10 10 40 100
ELECTIVE MODULES:	
20 credits from the relevant stream Modules Eng: 100 – 199; L&M: 200 – 299; Tech: 300 – 399	20
TOTAL:	**200**

E. Postgraduate Certificate in Defence and Security (Leadership and Management) - Leadership and Security pathway

The accumulation of 60 credits[5] through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Induction Introduction to Defence and Security Leadership and Management Decision Analysis and Support Stakeholder Management and Organisational Behaviour National Security and Emerging Global Trends Introduction to International Law and Use of Force	0 10 10 10 10 10 10
ELECTIVE MODULES:	
There are no Elective Modules at the PgCert in L&S Stream	0
TOTAL:	**60**

F. Postgraduate Diploma in Defence and Security (Leadership and Management) - Leadership and Security pathway

The accumulation of 120 credits[6] through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Induction Introduction to Defence and Security Leadership and Management Decision Analysis and Support Stakeholder Management and Organisational Behaviour National Security and Emerging Global Trends Introduction to International Law and Use of Force Research Methods **Online occurrence only Strategic Leadership in the Security Sector Security Sector Strategy and Policy Development	0 10 10 10 10 10 10 10 10 10
ELECTIVE MODULES:	
Elective 1: Any module from Modules, 234, and 267 - 270 Elective 2: Any module from Modules 227, 237, 271 - 275 Elective 3: 109,223, 227, 237, 267, 268, 269, 270, 271, 272, 274, 275, 348 & 356 (**D** occurrence only, subject to spaces on borrowed module)	10 10 10
TOTAL:	**120**

[5] Senate Regulations require a minimum of 60 learning credits to be accumulated for the Award of PgCert. The number of learning credits for individual courses is set during course validation.

[6] Senate Regulations require a minimum of 120 learning credits to be accumulated for the Award of PgDip. The number of learning credits is set during course validation.

G. MSc in Defence and Security (Leadership and Management) - Leadership and Security pathway

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	Credits
COMPULSORY MODULES:	
Induction Introduction to Defence and Security Leadership and Management Decision Analysis and Support Stakeholder Management and Organisational Behaviour National Security and Emerging Global Trends Introduction to International Law and Use of Force Research Methods** Online occurrence only Strategic Leadership in the Security Sector Security Sector Strategy and Policy Development Thesis	0 10 10 10 10 10 10 10 10 10 80
ELECTIVE MODULES:	
Elective 1: Any module from Modules, 234, and 267 - 270 Elective 2: Any module from Modules 227, 237, 271 - 275 Elective 3: 109, 223, 227, 237, 267, 268, 269, 270, 271, 272, 274, 275, 348 & 356 (**D** occurrence only, subject to spaces on borrowed module)	10 10 10
TOTAL:	**200**

H. Postgraduate Certificate Defence and Security (Engineering) - Aero Systems pathway

The accumulation of 60 credits[7] through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Induction Leadership and Management Decision Analysis and Support Stakeholder Management and Organisational Behaviour Research Methods	0 10 10 10 10
ELECTIVE MODULES:	
Students must take modules to the value of 20 credits from the selection below: Electro-magnetic Propagation & Devices Communication Principles Electro-optics and Infrared Systems 1 Radar Principles Guided Weapons Radar Electronic Warfare Fundamentals of Modelling and Simulation Electro-optics and Infrared Systems 2	20
TOTAL:	**60**

[7] Senate Regulations require a minimum of 60 learning credits to be accumulated for the Award of PgCert. The number of learning credits for individual courses is set during course validation

I. Postgraduate Diploma Defence and Security (Engineering) - Aero Systems pathway

The accumulation of 120 credits[8] through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Induction	0
Leadership and Management	10
Decision Analysis and Support	10
Stakeholder Management and Organisational Behaviour	10
Research Methods	10
ELECTIVE MODULES:	
Electro-magnetic Propagation & Devices	10
Communication Principles	10
Electro-optics and Infrared Systems 1	10
Radar Principles	10
Guided Weapons	10
Radar Electronic Warfare	10
Fundamentals of Modelling and Simulation	10
Electro-optics and Infrared Systems 2	10
TOTAL:	**120**

J. MSc Defence and Security (Engineering) - Aero Systems pathway

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	Credits
COMPULSORY MODULES:	
Induction	0
Leadership and Management	10
Decision Analysis and Support	10
Stakeholder Management and Organisational Behaviour	10
Research Methods	10
Thesis	80
ELECTIVE MODULES:	
Electro-magnetic Propagation & Devices	10
Communication Principles	10
Electro-optics and Infrared Systems 1	10
Radar Principles	10
Guided Weapons	10
Radar Electronic Warfare	10
Fundamentals of Modelling and Simulation	10
Electro-optics and Infrared Systems 2	10
TOTAL:	**200**

[8] Senate Regulations require a minimum of 120 learning credits to be accumulated for the Award of PgDip. The number of learning credits is set during course validation.

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists, and the student meets the requirements of that lower award.

Pass Criteria
The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of ≥50%;
- An average mark of ≥50% across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee); [9]
- **For Taught Assessments,** the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
  - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a re-sit award capped at 50% would be insufficient to achieve an overall average mark of ≥50% across the taught assessments);
  - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
  - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥40 credits, which are not part of the taught assessment average), the pass mark of ≥50% (where they exist);
- **For the thesis,** a mark of ≥50% in order to receive a pass (where it exists).

7. How is the course structured?

Courses within the Defence and Security Programme are structured as Part-time. Students register for the course in September and are expected to complete the course within 1-3 years for the PgCert, PgDip and MSc.

The induction module is a pre-requisite for the following modules:
- Introduction to Defence and Security
- Leadership and Management
- Decision Analysis and Support
- Stakeholder Management and Organisational Behaviour

This means that students must undertake the induction module first.

[9] Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of <40% (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award (<50%).

The majority of core common modules are distance delivery over a period of 15 weeks including assessment. This enables elective modules to be taken in parallel when necessary. See course pathways above.

The majority of 10 credit elective modules comprise pre-reading at a distance. For all courses and pathways, less Leadership and Security pathway, the teaching is delivered through up to one week residential and then assessment at a distance. Teaching on the Leadership and Security pathway is delivered online and spread over two to three weeks followed by assessment at distance.

A 10 credit module has an indicative requirement for 100 hours of study in total.

8. **Course Level Assessment Strategy**[10]

This course aims to develop Defence and Security Practitioner skills and behaviours in addition to the academic focus of a Master's level qualification. These skills require proficiency in written communication and in the practical application of systems methods though facilitated workshops.

This degree includes modules from across a broad spectrum of subjects, from engineering, technology management, to leadership. There are, consequently, an array of assessment approaches used in order to ensure students are able to appropriately demonstrate their grasp of key topics, theories and analytical frameworks, and provide adapted feedback in a focused and timely way. Assessment will include formative assessment on the selection of methods for problem resolution, design of interventions and workshops and on presentation skills. Such feedback will be given immediately after the presentations by the tutor and peers. Summative assessment will include the preparation of reports, reflection on the application of methods, examinations, workshops, presentations and essays to demonstrate knowledge of the underlying theory and practices relevant to the Defence and Security sector.

The assessment tasks are challenging and enable students to demonstrate a full range of skills and attributes in line with their described pathway's learning objectives. The core common modules (Introduction to Defence and Security, Leadership and Management, Stakeholder Management and Organisational Behaviour, and Decision Analysis and Support) will introduce students to the core principles, theories, approaches and methods required to integrate and contextualise the pathway specific content presented later. This learning will be assessed through a variety of methods which will be clearly stated within the module descriptors.

Modules are supported by a number of formative tasks including group discussion, case studies, oral presentations. Formative feedback is given verbally within the classroom following discussions, via a written summary for case studies from the module leader and oral feedback provided by the tutor and peers for presentations. During on-line modules, students will engage with interactive learning activities which incorporate formative feedback.

The taught components precede the research element, so assessment can be used to develop skills required for the individual research projects or dissertations. Students are generally expected to be more self-directed in their learning during the research phase of their studies, and guidance will be provided through the Research Methods or Capstone modules as appropriate.
The role of every module has been mapped to the relevant ILOs that it is intended to support ensuring consistent academic development for all students.

[10] Guidance to aid colleagues writing or updating a course-level assessment strategy for inclusion in the Course Specification can be found as Appendix K in either the Senate Handbook on Setting up a New Taught Course or the Senate Handbook on Managing Taught Courses https://intranet.cranfield.ac.uk/EducationServices/Pages/SenateHandbooksA-Z.aspx

Course modules

The following modules outline all parts of the programme leading to MSc. Other awards associated with the course include some or all of these modules.

Module Number	Module code	Title	Module Leader	Contact hours[11]	Total hours delivered by Visiting Lecturers[12]	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[13] - 40% or 50%	Type of Assessment	Weighting within module[14] (%) of Independent assessments	Weighting within module of multi-part assessments	Type of Assessment	Weighting of individual elements of multi-part assessment[16]	Assessment Submission and/or exam date[17]	Assessment / Exam Retake date
0	R-DSP-I	Induction **	Henrietta Campbell	3.5	0	0	N	A: 04/09/23 B: 15/04/24	04/09/23 15/04/24	05/09/23 16/04/24	N/A	AO						
1	R-DSP-IDS	Introduction to Defence and Security **	Gemma Collantes Celador	20	0	10	N	A: 06/09/23 B: 17/04/24	06/09/23	08/09/23	50	ICW	100				16/10/23	Next available opportunity

[11] Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice
[12] Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)
[13] A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.
[14] For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education.
[15] For **multi-part assessments** please record the overall weighting of module which should be 100%. Multipart assessments should only be included in courses where there is a clear andragogical reason and where each element forms part of a continuous learning and assessment experience for students.
[16] Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate*)*. If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.
[17] Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.
** Denotes distance learning module

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours[11]	Total hours delivered by Visiting Lecturers [12]	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[13] - 40% or 50%	Type of Assessment	Weighting within module[14] (%) of Independent assessments	Weighting within module of multi-part assessments	Type of Assessment	Weighting of individual elements of multi-part assessment[16]	Assessment Submission and/or exam date[17]	Assessment / Exam Retake date
									17/04/24	19/04/24							31/05/24	
2	R-DSP-LM	Leadership and Management **	Ifti Zaidi	5	0	10	N	09/10/23 Teaching start date: 09/10/23	09/10/23 Teaching start date: 09/10/23	20/10/23 Teaching end date: 13/10/23	50	ICW	100				08/01/24	Next available opportunity
3	R-DSP-DAS	Decision Analysis and Support **	Ken McNaught	10	0	10	N	05/02/24 Teaching start date: 05/02/24	05/02/24 Teaching start date: 05/02/24	20/05/24 Teaching end date: 09/02/24	50	ICW	100				22/05/24	Next available opportunity
4	R-DSP-SMOB	Stakeholder Management and Organisational Behaviour **	Robby Allen	10	0	10	N	20/05/24 Teaching start date: 06/05/24	20/05/24 Teaching start date: 06/05/24	02/09/24 Teaching end date: 10/05/24	50	ICW	100				02/09/24	Next available opportunity
5	R-DL-RM R-DSP-RM	Research Methods Research Methods**	Ifti Zaidi Tim Ferris	10	0	10	N	A: 22/01/24 B: 22/05/24	22/01/24 22/05/24	26/01/24 04/09/24	50	ICW	100				01/05/24 11/11/24	Next available opportunity

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours[11]	Total hours delivered by Visiting Lecturers [12]	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[13] - 40% or 50%	Type of Assessment	Weighting within module[14] (%) of Independent assessments	Weighting within module of multi-part assessments	Type of Assessment	Weighting of individual elements of multi-part assessment[16]	Assessment Submission and/or exam date[17]	Assessment / Exam Retake date
Engineering Stream																		
106	R-FP-IFI	Introduction to Fire Investigation	Mike Moulden	32	0	10	Y	04/12/2023	04/12/2023	08/12/2023	40	ICW	100				PT 05/02/24	Next available opportunity
107	R-FP-FIEED	Forensic Investigation of Explosives and Explosive Devices	Nathalie Mai and Mike Harris	37	0	10	Y	23/10/23	23/10/23	27/10/23	40	ICW	100				PT 11/12/23	Next available opportunity
108	R-FP-IFIFB	Introduction to Firearms Investigations and Forensic Ballistics	Kate Hewins	32	0	10	Y	13/11/2023	13/11/2023	17/11/2023	40	ICW	100				PT 17/01/24	Next available opportunity
109	N-SAI-ISMS	Aviation Safety Management**	Dr Simon Mitchell Dr David Barry	30	0	10	Y	18/03/24 (Occ B23)	18/03/24 (Occ B23)	22/03/24 (Occ B23)	40	ICW	100				30/05/23 (Occ B23)	Next available opportunity
110	R-MAA-IHF	Introduction to Human Factors	Laura Lacey	40	0	10	Y	NOT RUNNING AY 23/24	NOT RUNNING AY 23/24	NOT RUNNING AY 23/24	40	ICW	100				02/08/24	AY23/24

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours[11]	Total hours delivered by Visiting Lecturers [12]	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[13] - 40% or 50%	Type of Assessment	Weighting within module[14] (%) of Independent assessments	Weighting within module of multi-part assessments	Type of Assessment	Weighting of individual elements of multi-part assessment[16]	Assessment Submission and/or exam date[17]	Assessment / Exam Retake date
112	R-MAA-MAS	Military Aircraft Systems	John Economou	35	0	10	Y	10/06/24	10/06/24	14/06/24	40	ICW	100				02/08/24	AY23/24
113	N-AW-RA	Practical Reliability	Dr Simon Place	30	10	10	Y	15/01/24	15/01/24	19/01/24	40	ICW	100				09/04/24	Next available opportunity
114	R-MAA-GW	Guided Weapons	David Galvao Wall	32	0	10	Y	15/01/24 A23 13/05/24 B23	15/01/24 13/05/24	19/01/24 17/05/24	40	ICW	100				15/03/24	AY23/24 AY23/24
115	R-ESD-ED	Element Design (ED)	Dave Simner	35	0	10	Y	04/03/24	04/03/24	08/03/24	40	ICW	100				15/03/24 12/07/24	By individual arrangement
116	R-ESD-FB	Fundamentals of Ballistics (FoB)	Clare Knock	32	0	10	Y	02/10/23	02/10/23	06/10/23	40	ICW	100				17/11/23 FT 01/12/23 PT	By individual arrangement

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

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117	R-ESD-MVPD	Military Vehicle Propulsion and Dynamics	Dave Simner	32	0	10	Y	04/12/23	04/12/23	15/12/23	40	ICW	100				09/02/24 FT 23/02/24 PT	By individual arrangement
118	R-ESD-MSC	Modelling, Simulation and Control	Thiru Thirulogasingam	35	0	10	Y	18/09/23	18/09/23	22/09/23	40	ICW	100				03/11/23 FT 17/11/23 PT	By individual arrangement
119	R-ESD-RSE	Reliability and Systems Effectiveness	Aimee Helliker	31	0	10	Y	26/02/24	26/02/24	01/03/24	40	ICW	100				12/04/24 FT 26/04/24 PT	By individual arrangement
120	R-ESD-SURV	Survivability	Gareth Appleby-Thomas	35	0	10	Y	08/01/24	08/01/24	12/01/24	40	ICW	100				23/02/24 FT 08/03/24 PT	By individual arrangement
121	R-ESD-VSI	Vehicle Systems Integration	David Disket	32	0	10	Y	12/02/24	12/02/24	16/02/24	40	ICW	100				29/03/24 FT 12/04/24 PT	By individual arrangement
122	R-ESD-WST	Weapon Systems Technology	Hugh Goyder	31	0	10	Y	25/09/23	25/09/23	29/09/23	40	ICW	100				10/11/23 FT 24/11/23 PT	By individual arrangement
123	N-CST-AI	Artificial intelligence	Jun Li	35	0	10	Y	05/02/24	05/02/24	09/02/24	40	ICW	100				NOT RUNNING AY 23/24	Next available opportunity
124	N-AVC-SF	Sensor Fusion	Hyo-Sang Shin	28	0	10	Y	20/11/2023	20/11/2023	29/11/2023	40	ICW	100				05/01/24	Next Available Opportunity

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125	N-AVC-AIAS	Artificial Intelligence for Autonomous Systems	Ivan Petrunin	28	0	10	Y	03/01/2024	03/01/2024	09/01/2024	40	ICW	100				02/02/24	Next available opportunity
126	N-AVC-GNS	Guidance and Navigation for UAS	Hae-In Lee	28	0	10	Y	15/01/2024	15/01/2024	23/01/2024	40	ICW	100				16/02/24	Next available opportunity
127	N-AAI-ICPS	Intelligent Cyber-Physical Systems	Saba Al-Rubaye	28	0	10	Y	27/11/23	27/11/23	01/12/2023	40	ICW	100				PT 29/01/24	Next available opportunity
128	N-AAI-DAV	Data Analytics and Visualization	Ivan Petrunin	28	0	10	Y	20/11/2023	20/11/2023	25/11/2023	40	ICW	100				PT 22/01/24	Next available opportunity
Leadership and Management Stream																		
223	R-DAM-IDDA	The International Dimensions of Defence Acquisition**	Pete Ito	30	0	10	N	04/03/24	04/03/24	08/03/24	40	ICW	100				15/04/24	Next available opportunity
227	R-PPM-FPPM	Foundations of Programme	Pete Ito	20	0	10	Y	05/02/2024	05/02/2024	09/02/2024	40	ICW	100				22/04/24	Next available opportunity

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		and Project Management**																
231	R-DL-NSRC	National Security: Resilience and Crisis**	Bryan Watters	20	4	10	N	12/02/24	12/02/24	23/02/24	40	ICW	100				28/03/24	Next available opportunity
233	R-DL-PL	The Psychology of Leadership**	Bryan Watters	20	0	10	N	07/05/24	07/05/24	09/05/24	40	ICW	100				28/06/24	Next available opportunity
234	R-DL-SMD	Strategic Management in Defence**	Caroline Micklewright	20	2	10	N	13/05/24	13/05/24	15/05/24	40	ICW	100				24/06/24	Next available opportunity
235	R-IDS-TCT	Counterterrorism and Intelligence	Anastasia Filippidou	20	0	10	Y	NOT RUNNING AY 23/24	NOT RUNNING AY 23/24	NOT RUNNING AY 23/24	40	ICW	100				NOT RUNNING AY 23/24	Next available opportunity
237	R-IDS-GVAC	Gender, Violence and Armed Conflict**	Anicee Van Engeland	20	0	10	N	NOT RUNNING AY 23/24	NOT RUNNING AY 23/24	NOT RUNNING AY 23/24	40	ICW	100				NOT RUNNING AY 23/24	Next available opportunity

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263	R-DSP-NSEGT	National Security & Emerging Global Trends**	Gemma Collantes-Celador	20	0	10	N	08/01/24 Teaching start date: 08/01/24	08/01/24 Teaching start date: 08/01/24	04/03/24 Teaching end date: 12/01/24	40	ICW	100				04/03/24	Next available opportunity
264	R-DSP-IILUF	Introduction to International Law and the Use of Force**	David Turns	20	0	10	N	NOT RUNNING AY 23/24	NOT RUNNING AY 23/24	NOT RUNNING AY 23/24	40	ICW	100				NOT RUNNING AY 23/24	Next available opportunity
265	R-DSP-SL	Strategic Leadership in the Security Sector**	Bryan Watters	20	0	10	N	22/01/24 Teaching start date: 15/01/24	22/01/24 Teaching start date: 15/01/24	18/03/24 Teaching end date: 19/01/24	40	ICW	100					Next available opportunity
266	R-DSP-SPD	Security Sector Strategy and Policy Development**	Ifti Zaidi	20	0	10	N	25/03/24 Teaching start date: 25/03/24	25/03/24 Teaching start date: 25/03/24	24/05/24 Teaching end date: 29/03/24	40	ICW	100				26/05/24	Next available opportunity
267	R-DSP-GRL	Governance and Rule of Law**	Anicee Van England	20	0	10	N	NOT RUNNING AY 23/24	NOT RUNNING AY 23/24	NOT RUNNING AY 23/24	40	ICW	100				NOT RUNNING AY 23/24	Next available opportunity
268	R-DSP-LMC	Leading and Managing Change in	Caroline Micklewright	20	0	10	N	04/09/23 Teaching start date: 04/09/23	04/09/23 Teaching start date: 04/09/23	27/10/23 Teaching end date: 08/09/23	40	ICW	100				27/10/23	Next available opportunity

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		Security Sector Organisations**																
269	R-DSP-IP	Instructional Practice**	Ifti Zaidi / Robby Allen	20	0	10	N	15/04/24	15/04/24	19/04/24	40	ICW	100				31/05/2024	Next available opportunity
270	R-DSP-IHLCR	International Humanitarian Law and Command Responsibility**	David Turns	20	0	10	N	NOT RUNNING AY 23/24	NOT RUNNING AY 23/24	NOT RUNNING AY 23/24	40	ICW	100				NOT RUNNING AY 23/24	Next available opportunity
271	R-DSP-FES	Financial and Economic Security**	Irfan Ansari	20	0	10	N	06/11/23 Teaching start date: 06/11/23	06/11/23 Teaching start date: 06/11/23	08/01/24 Teaching end date: 10/11/23	40	ICW	100				05/01/24	Next available opportunity
272	R-DSP-MSRC	Managing Security in a Regional Context**	Anicee Van England	20	0	10	N	NOT RUNNING AY 23/24	NOT RUNNING AY 23/24	NOT RUNNING AY 23/24	40	ICW	100				NOT RUNNING AY 23/24	Next available opportunity
274	R-DSP-BIPS	Building Integrity in the Public Sector**	Ifti I Zaidi / Robby Allen	20	0	10	N	06/11/23 Teaching start date: 20/11/23	06/11/23 Teaching start date: 20/11/23	08/01/24 Teaching end date: 24/11/23	40	ICW	100				12/01/24	Next available opportunity

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275	R-DSP-MPPI	Managing Post-conflict Peace Interventions**	Gemma Collantes-Celador	20	0	10	N	NOT RUNNING AY 23/24	NOT RUNNING AY 23/24	NOT RUNNING AY 23/24	40	ICW	100				NOT RUNNING AY 23/24	Next available opportunity
289	R-DL-LDD	Leadership Development in Defence **13	Caroline Micklewright	20	12	10	Y	13/11/23	13/11/23	15/11/23	40	ICW	100				02/01/24	Next Available Opportunity
Technology Stream **(Includes Modules 123-131 from Engineering Stream as common modules)**																		
342	R-AMOR-IS	Intelligent Systems	Mr Jon Miller	30	0	10	Y	22/01/2024	22/01/2024	26/01/24	40	ICW	100				04/03/24	22/07/24
343	R-AMOR-WGC	War Gaming and Combat Modelling A War Gaming & Combat Modelling B, C and D **	Mr J D Smith	30	0	10	Y	A:23/10/23 B:09/10/23 C:15/01/24	23/10/23 09/10/23 15/01/24	27/10/23 15/12/23 22/03/24	40	ICW	100				A FT: 20/11/23 A PT: 04/12/23 B:18/12/23 C:25/03/24	A FT: 22/01/24 A PT: 22/07/24 B, C, D: Next 10-week VLE module block.

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								D:20/05/24	20/05/24	26/07/24							D:29/07/24	
344	R-DEFCY-FMC	Foundations of Cyber	Dr Danny Steed	30	0	10	Y	04/09/23	04/09/23	08/09/23	40	ICW	100				02/10/23	AY24/25
345	R-DEFCY-ST	Social Technologies	Robert Black	72	0	10	Y	02/01/24	22/01/24	26/01/24	40	ICW	100				19/02/24	AY24/25
346	R-DEFCY-HD	The Human Dimension	Antoinette Caird-Daley	30	0	10	Y	25/09/23	16/10/23	20/10/23	40	ICW	100				13/11/23	AY24/25
347	R-SISD-DLDS	Data Led Decision Support & Artificial Intelligence	Adam Zagorecki	30	0	10	Y	B:04/03/24	25/03/24	28/03/24	40	ICW	100				22/04/24	AY24/25
348	R-AMOR-RTG	Real Time Graphics A (FT) Real Time Graphics B, C and D (PT) **	Mr J M Hoggard	32	0	10	Y	A:09/10/23 B:09/10/23 C:15/01/24	09/10/23 09/10/23 15/01/24	13/10/23 15/12/23 22/03/24	40	ICW	100				A FT: 06/11/23 A PT: 20/11/23 B:18/12/23 C:25/03/24	A FT: 22/01/24 A PT: 22/07/24 B, C, D: Next 10-week VLE module block.

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								D:20/05/24	20/05/24	26/07/24							D:29/07/24	
349	R-AMOR-FMS	Foundations of Modelling & Simulation A & B C: DSP Aerosystem Pathway only	Mr J M Hoggard	32	0	10	*Y*	A:11/09/23 B:15/01/24 C:04/03/24	11/09/23 15/01/24 04/03/24	15/09/23 19/01/24 08/03/24	40	ICW	100				A FT: 09/10/23 A PT: 23/10/23 B PT: 26/02/24 C PT: 15/04/24	A FT: 22/01/24 A PT: 22/07/24 B & C PT: 22/07/24
350	R-SISD-ETM	Emerging Technology Monitoring	Ian Owens	7	0	10	Y	08/01/24	08/01/24	10/05/24 end of online module	40	ICW	100				13/05/24 FT/PT	AY 23/24
351	R-SISD-MT	Methods and Tools for Information Systems /Development	Ian Owens	30	0	10	Y	25/09/23 18/09/23	25/09/23	29/09/23	40 40	GPRES ICW	25 75				29/09/23 FT/PT 09/10/23 FT 23/10/23 PT	AY 23/24

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352	R-SISD-STOV	Systems Thinking for Organisational Viability	Jeremy Hilton	35	0	10	Y	A 11/09/23 (PT Only) B 04/03/24 PT 18/03/24 FT	02/10/23 (PT Only) 25/03/24	06/10/23 (PT Only) 28/03/24	40	ICW	100				30/10/24 PT 09/04/24 FT 23/04/24 PT	AY 23/24 AY 23/24
353	R-SISD-PM	Programme and Project Management for Information Systems	Simon Renfrey	30	0	10	Y	25/09/23 PT 09/10/23 FT	16/10/23	20/10/23	40	ICW	100				30/10/23 FT 13/10/23 PT	AY 23/24
354	R-SISD-SE	Software Engineering	Pathmeswaran Raju	30	0	10	Y	06/11/23 PT 20/11/23 FT	27/11/23	01/12/23	40 40	GCW ICW	25 75				01/11/23 FT/PT 11/12/23 FT 09/01/24 PT	AY 23/24
355	R-AMOR-IORT	Introduction to Operational Research Techniques	Mr J D Smith	30	~~0~~	10	Y	11/09/23	11/09/23	15/09/23	40	ICW	100				23/10/23	22/07/24

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356	R-AMOR-LM	Logistics Modelling A Logistics Modelling B, C & D**	Dr J D Salt	30	0	10	Y	A:26/02/24 B:09/10/23 C:15/01/24 D:20/05/24	26/02/24 09/10/23 15/01/24 20/05/24	01/03/24 15/12/23 22/03/24 26/07/24	40	ICW	100				A FT: 25/03/24 A PT: 08/04/24 B:18/12/23 C:25/03/24 D:29/07/24	A FT: 22/04/24 A PT: 22/07/24 B, C, D: Next 10-week VLE module block.
357	R-AMOR-SAT	Statistical Analysis & Trials	Dr T J Ringrose	30	0	10	Y	08/01/24	08/01/24	12/01/24	40	ICW	100				19/02/24	22/07/24
358	R-SEE-ISSE	Introduction to Systems & Systems Engineering	Dr Steve Barker	30	0	10	Y	02/10/23	02/10/23	03/11/23	40	ICW	100				26/01/24	Next available opportunity
361	R-SEE-SDR	System Design and Realisation	Dr Tim Ferris	25		10	Y	20/05/24	25/06/24	28/06/24	40	ICW	100				27/09/24	Next available opportunity

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Engineering: Aero Systems Pathway																		
476	R-MES-EPD	Electromagnetic Propagation and Devices	Ivor Morrow	32	0	10	Y	NO FURTHER INTAKE										
477	R-MES-SPSA	Signal Processing Statistics and Analysis	Peter Barker	30	0	10	Y	NO FURTHER INTAKE										
478	R-MES-CP	Communication Principles	Peter Barker	30	0	10	Y	NO FURTHE R INTAKE										
479	R-MES-CS	Communication s Systems	Peter Barker	30	0	10	Y	NO FURTHER INTAKE										
480	R-MES-RP	Radar Principles	Alessio Balleri	30	0	10	Y	NO FURTHER INTAKE										
481	R-MES-REW	Radar Electronic Warfare	Ioannis Vagias	30	0	10	Y	NO FURTHER INTAKE										

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												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[13] - 40% or 50%	Type of Assessment	Weighting within module[14] (%) of Independent assessments	Weighting within module of multi-part assessments	Type of Assessment	Weighting of individual elements of multi-part assessment[16]	Assessment Submission and/or exam date[17]	Assessment / Exam Retake date
482	R-MES-EOIS1	Electro-optics and Infrared Systems 1	Ata Khalid	32	0	10	Y	NO FURTHER INTAKE										
483	R-MES-EOIS2	Electro-optics and Infrared Systems 2	Lounis Chermak	32	0	10	Y	NO FURTHER INTAKE										
484	R-MES-ASDP	Advanced Sensor Data Processing	Venkat Sastry	30	0	10	Y	NO FURTHER INTAKE										
485	R-MES-AR	Advanced Radar	Daniel Andre	30	0	10	Y	NO FURTHER INTAKE										
486	R-MES-IN	Information Networks	Philip Nobles	30	0	10	Y	NO FURTHER INTAKE										
487	R-MAA-MA	Military Avionics STA Communications and Navigation	Alessio Balleri	32	0	10	Y	NO FURTHER INTAKE										

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours[11]	Total hours delivered by Visiting Lecturers [12]	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[13] - 40% or 50%	Type of Assessment	Weighting within module[14] (%) of Independent assessments	Weighting within module of multi-part assessments	Type of Assessment	Weighting of individual elements of multi-part assessment[16]	Assessment Submission and/or exam date[17]	Assessment / Exam Retake date
488	R-MAA-UAS	Uninhabited Aircraft Systems	John Economou	35	0	10	Y	NO FURTHER INTAKE										
Further Defence and Security Modules																		
89	R-DSP-CDE	Capstone Development and Exploitation **	TBC	50	0	40	N	NOT RUNNING AY23/24	NOT RUNNING AY23/24	NOT RUNNING AY23/24	50 50 50	ICW 1 IPRES ICW 2	40 30 30				NOT RUNNING AY23/24	
90	R-DSP-THESIS	Thesis	Sean Price	30	0	80	N	A: 04/09/23 B: 15/04/24	04/09/23 15/04/24	02/09/24 15/04/25	50	THESIS	100				02/09/24 15/04/25	
91	R-DSP-CP	Capstone Portfolio	TBC	50	0	100	N	NOT RUNNING AY 23/24	NOT RUNNING AY 23/24	NOT RUNNING AY 23/24	50	IPROJ	100				NOT RUNNING AY 23/24	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Please list all modules that are used by another existing course.

Module code	**Module title**	**Course that owns the module**	**Other course(s)/ programme(s) that use the module**
R-FP-IFI	Introduction to Fire Investigation	Forensic Programme	
R-FP-FIEED	Forensic Investigation of Explosives and Explosive Devices	Forensic Programme	
R-FP-IFIFB	Introduction to Firearms Investigations and Forensic Ballistics	Forensic Programme	
N-SAI-ISMS	Aviation Safety Management	Safety Accident and Investigation	Airworthiness, Military Aerospace and Airworthiness, Air Transport Management, Safety and Human Factors in Aviation
R-MAA-IHF	Introduction to Human Factors	Military Aerospace and Airworthiness	
R-MAA-MAS	Military Aircraft Systems	Military Aerospace and Airworthiness	Airworthiness
N-AW-RA	Practical Reliability	Airworthiness	Military Aerospace and Airworthiness
R-MAA-GW	Guided Weapons	Military Aerospace and Airworthiness	Weapons and Vehicle Systems
R-ESD-ED	Element Design	Weapons and Vehicle Systems Programme	
R-ESD-FB	Fundamentals of Ballistics	Weapons and Vehicle Systems Programme	
R-ESD-MVPD	Military Vehicle Propulsion and Dynamics	Weapons and Vehicle Systems Programme	
R-ESD-MSC	Modelling, Simulation and Control	Weapons and Vehicle Systems Programme	
R-ESD-RSE	Reliability and Systems Effectiveness	Weapons and Vehicle Systems Programme	
R-ESD-SURV	Survivability	Weapons and Vehicle Systems Programme	
R-ESD-VSI	Vehicle Systems Integration	Weapons and Vehicle Systems Programme	
R-ESD-WST	Weapon Systems Technology	Weapons and Vehicle Systems Programme	

N-CST-AI	Artificial intelligence	Computational & Software Techniques in Engineering	
N-AVC-SF	Sensor Fusion	Autonomous Vehicle Dynamics and Control	
N-AVC-AIAS	Artificial Intelligence for Autonomous Systems	Autonomous Vehicle Dynamics and Control	
N-AVC-GNS	Guidance and Navigation for UAS	Autonomous Vehicle Dynamics and Control	
N-AAI-ICPS	Intelligent cyber-physical systems	Applied Artificial Intelligence	
N-AAI-DAV	Data analytics and visualization	Applied Artificial Intelligence	
R-IDS-TCT	Counterterrorism and Intelligence	Counterterrorism	
R-AMOR-IS	Intelligent Systems	Applied Mathematics and Operational Research Programme	
R-AMOR-WGC	War Gaming and Combat Modelling	Applied Mathematics and Operational Research Programme	
R-DEFCY-FMC	Foundations: Management of Cyber	Defence Cyber Masters Programme	
R-DEFCY-ST	Social Technologies	Defence Cyber Masters Programme	
R-DEFCY-HD	The Human Dimension	Defence Cyber Masters Programme	
R-SISD-DLDS	Data Led Decision Support	Information Capability Management	Defence Cyber Masters Programme
R-AMOR-RTG	Real Time Graphics	Defence Simulation and Modelling	
R-AMOR FMS	Foundations of Modelling and Simulation	Defence Simulation and Modelling	Military Electronic Systems Engineering
R-SISD-ETM	Emerging Technology Monitoring	Information Capability Management	
R-SISD-MT	Methods and Tools for Information Systems Development	Information Capability Management	

R-SISD-STOV	Systems Thinking for Organisational Viability	Information Capability Management	
R-SISD-PM	Programme and Project Management for Information Systems	Information Capability Management	
R-SISD-SE	Software Engineering	Information Capability Management	
R-AMOR-IORT	Introduction to Operational Research Techniques	Military Operational Research	
R-AMOR-LM	Logistics Modelling	Military Operational Research	
R-AMOR-SAT	Statistical Analysis and Trials	Military Operational Research	
R-SEE-ISSE	Introduction to Systems & Systems Engineering	Systems Engineering	
R-SEE-SDR	Systems Design and Realisation	Systems Engineering	
R-MES-EPD	Electromagnetic Propagation and Devices	Military Electronic Systems Engineering	Pg Cert Communications Electronic Warfare AP Pg Cert Sensors Electronic Warfare AP Pg Cert Military Electronic Systems Engineering Foundations
R-MES-SPSA	Signal Processing Statistics and Analysis	Military Electronic Systems Engineering	Pg Cert Communications Electronic Warfare AP Pg Cert Sensors Electronic Warfare AP Pg Cert Military Electronic Systems Engineering Foundations AP Guided Weapon Systems AP compulsory for Mc and Pgip and elective PGCert
R-MES-CP	Communication Principles	Military Electronic Systems Engineering	
R-MES-CS	Communications Systems	Military Electronic Systems Engineering	Pg Cert Communications Electronic Warfare AP Pg Cert Military Electronic Systems Engineering Foundations
R-MES-RP	Radar Principles	Military Electronic Systems Engineering	Pg Cert Communications Electronic Warfare AP Pg Cert Sensors Electronic Warfare AP Pg Cert Military Electronic Systems Engineering Foundations AP Guided Weapon Systems AP compulsory

R-MES-REW	Radar Electronic Warfare	Military Electronic Systems Engineering	Pg Cert Sensors Electronic Warfare AP Guided Weapon Systems
R-MES-EOIS1	Electro-optics and Infrared Systems 1	Military Electronic Systems Engineering	Sensors Electronic Warfare AP Pg Cert Military Electronic Systems Engineering Foundations AP, Guided Weapon Systems AP
R-MES-EOIS2	Electro-optics and Infrared Systems 2	Military Electronic Systems Engineering	Sensors Electronic Warfare compulsory Guided Weapon Systems AP Compulsory: MSc, PgDip Elective: PgCert
R-MES-ASDP	Advanced Sensor Data Processing	Military Electronic Systems Engineering	
R-MES-AR	Advanced Radar	Military Electronic Systems Engineering	
R-MES-IN	Information Networks	Military Electronic Systems Engineering	Communications Electronic Warfare
R MAA MA	Military Avionics STA Communications and Navigation	Military Aerospace and Airworthiness	
R-MAA-UAS	Uninhabited Aircraft Systems	Military Aerospace and Airworthiness	

8. How are the ILOs assessed?

The following assessment types are utilised:

Formative Assessment

Across distance and residential modules students will be provided with feedback on a range of activities in order to grow their confidence ahead of summative assessment tasks. Formative assessment may take the form of peer review by fellow students, lecturers and module leaders with a variety of approaches being utilised.

Summative Assessment.

The course uses a range of assessment methods including exams, essays, literature reviews, and application of concepts to real world case studies:

This approach has been adopted because:

The breadth of assessment methods are intended to cater for differing learning styles ensuring inclusion across the student cohort and minimising any potential disadvantage from limiting assessment types. For students completing the MSc, the individual thesis also requires students to be assessed on their written presentation skills.

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

(Module numbers should correspond with those used in the Course module table above.)

Award ILOs / Module No.	ILO 1	ILO 2	ILO 3	ILO 4	ILO 5	ILO 6	ILO 7	ILO 8	ILO 9	ILO 10	ILO 11	ILO 12	ILO 13	ILO 14	ILO 15	ILO 16	ILO 17	ILO 18	ILO 19	ILO 20	ILO 21	ILO 22	ILO 23
1	ICW								ICW						ICW								
2		ICW								ICW	ICW							ICW					
3			ICW		ICW							ICW					ICW						
4				ICW								ICW	ICW			ICW							
5	ICW					ICW	ICW	ICW			ICW	ICW		ICW		ICW			ICW				ICW
107	ICW					ICW				ICW													
108	ICW					ICW				ICW													
109	ICW		ICW			ICW		ICW		ICW													
110	ICW		ICW				ICW			ICW													
111					ICW		ICW	ICW															
112	ICW					ICW				ICW													
113			ICW				ICW																
114					ICW		ICW	ICW	ICW														
115	ICW		ICW		ICW			ICW															
116	EX				EX	EX																	
117	ICW					ICW	ICW																
118			ICW				ICW/ OR																
119	ICW				ICW		ICW																
120	ICW					ICW	ICW																
121					ICW	ICW		ICW	ICW														
122					ICW				ICW														
123						ICW			ICW	ICW						ICW							
124						ICW	ICW	ICW							ICW								

Award ILOs / Module No.	ILO 1	ILO 2	ILO 3	ILO 4	ILO 5	ILO 6	ILO 7	ILO 8	ILO 9	ILO 10	ILO 11	ILO 12	ILO 13	ILO 14	ILO 15	ILO 16	ILO 17	ILO 18	ILO 19	ILO 20	ILO 21	ILO 22	ILO 23
125						ICW		ICW		ICW					ICW	ICW							
126						ICW	ICW			ICW					ICW	ICW							
127						ICW		ICW	ICW							ICW	ICW						
128						ICW				ICW						ICW							
223	ICW			ICW							ICW												
227			ICW		ICW						ICW	ICW	ICW	ICW									
231	ICW										ICW												
233	ICW	ICW											ICW										
234	ICW										ICW												
235	ICW												ICW	ICW									
237	ICW		ICW									ICW											
263	ICW	ICW	ICW	ICW																			
264	ICW		ICW		ICW																		
265											ICW			ICW									
266												ICW	ICW	ICW									
267											ICW	ICW	ICW	ICW									
268											ICW	ICW	ICW	ICW									
269												ICW		ICW									
270											ICW		ICW										
271												ICW	ICW										
272												ICW	ICW	ICW									
274											ICW	ICW	ICW										
275											ICW	ICW	ICW	ICW									
289											ICW		ICW	ICW									
342					ICW											ICW							

Award ILOs Module No.	ILO 1	ILO 2	ILO 3	ILO 4	ILO 5	ILO 6	ILO 7	ILO 8	ILO 9	ILO 10	ILO 11	ILO 12	ILO 13	ILO 14	ILO 15	ILO 16	ILO 17	ILO 18	ILO 19	ILO 20	ILO 21	ILO 22	ILO 23
343			ICW													ICW							
344		ICW		ICW																			
345				ICW																			
346	ICW																ICW						
347			ICW	ICW	ICW																		
348			ICW																				
349			ICW												ICW								
350	ICW														ICW			ICW					
351					ICW/ GPRES										ICW/ GPRES	ICW/ GPRES							
352				ICW														ICW					
353			ICW												ICW								
354			ICW/ GCW		ICW/ GCW													ICW/ GCW					
355			EX													EX							
356	ICW		ICW														ICW						
357			EX													EX							
358	ICW			ICW	ICW											ICW		ICW					
361	ICW				ICW										ICW			ICW					
476	ICW		ICW		ICW			ICW							ICW								
477					ICW			ICW	ICW						ICW	ICW							
478	ICW		ICW		ICW	ICW	ICW								ICW	ICW							
479	ICW		ICW		ICW		ICW	ICW	ICW						ICW	ICW							
480					ICW	ICW	ICW		ICW						ICW			ICW					
481					ICW		ICW	ICW							ICW			ICW					
482					EX	EX		EX	EX						EX	EX							
483					ICW	ICW	ICW		ICW						ICW			ICW					
484					ICW	ICW	ICW		ICW						ICW			ICW					
485					ICW		ICW	ICW	ICW						ICW	ICW		ICW					
486	ICW		ICW		ICW	ICW		ICW	ICW						ICW			ICW					

Award ILOs / Module No.	ILO 1	ILO 2	ILO 3	ILO 4	ILO 5	ILO 6	ILO 7	ILO 8	ILO 9	ILO 10	ILO 11	ILO 12	ILO 13	ILO 14	ILO 15	ILO 16	ILO 17	ILO 18	ILO 19	ILO 20	ILO 21	ILO 22	ILO 23
487	ICW		ICW		ICW	ICW			ICW						ICW	ICW		ICW					
488	GCW		GCW		GCW		GCW		GCW						GCW			GCW					
89	ICW1 IPRES ICW2				IPRES ICW2														ICW1 IPRES ICW2	ICW1	ICW1 ICW2	ICW1 IPRES ICW2	ICW1 IPRES ICW2
90																			THESIS	THESIS	THESIS	THESIS	THESIS
91																			IPROJ	IPROJ	IPROJ	IPROJ	IPROJ

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	Modules Covered	Assessment	
		Type	Weight (%)

9. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who provides authoritative guidance on policy and procedure to the Panel. Proposals are reviewed in line with the UK Quality Code for Higher Education. New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guiding principles to meet the Expectations and Core Practices of the UK Quality Code for Higher Education. External examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.

2. A Partnership Delivery Approval Panel then considers whether the proposal meets the UK Quality Code for Higher Education. The delivery of new partnership provision is ultimately approved by the Universities Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

10. What opportunities are graduates likely to have on completing the course?

The course aims to ensure that graduates are better prepared to tackle the current and emerging demands of defence and security. Given the rapidly changing nature of this environment the education will allow graduates to recognise emerging trends and respond effectively and proactively. As the course ties together a broad technical and business base and is supported by a wide range of public and private sector organisations the qualification will be noteworthy on the CV's of those wishing to move into strategic and operational positions in the defence and security sector.

COURSE SPECIFICATION

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

COURSE TITLE: Design Thinking

Date of first publication/latest revision: 20.03.2018/June 2024

1. What is the course?

Course information

Course Title	Design Thinking
Course code	MNDETFTC, MNDETPTC, PDDETFTC, PDDETPTC, PCDETFTC, PCDETPTC
Academic Year	2023-24
Valid entry routes	MDes, PgDip, PgCert
Additional exit routes	PgDip, PgCert
Mode of delivery	Full time, Part time
Location(s)[1] of Study	Cranfield campus
School(s)	SWEE
Theme	Design Engineering
Centre	Centre for Competitive Creative Design (C4D)
Course Director	Mr Paul Lighterness
Awarding Body	Cranfield University
Is this an AP Contract course?[2]	N/A
Is this course offered as a Cranfield Mastership?	No
Apprenticeship Standard the course is mapped to	N/a
Is the Degree apprenticeship integrated or non-integrated?	N/a
Is the Mastership offered as an open and/or closed course?	N/a

[1] If any part of this course is delivered at another site, please note which one(s) here

[2] AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Teaching Institution	Cranfield University
Admissions body	Cranfield University
Entry requirements	Standard University entry requirements
UK Qualifications Framework Level	QAA FHEQ Level 7 (Masters)
Benchmark Statement(s)	N/A
Registration Period(s) available	MSc: 1 Year FT 3 Years PT
Course Start Month(s)	Full time: October, Part time: Throughout the year but typically an October start

Institutions delivering the course

This course is delivered by Centre for Competitive Creative Design (C4D) where the research interests include:

- development of design-led thinking and open innovation within engineering and management sectors
- innovation in the development of areas of social responsibility,
- evaluation of design effectiveness and methods and applications of design futures.

Communities of practise include:
- Break-through Innovation
- Materials Innovation
- Circular Innovation
- Data Driven Innovation

Cranfield University interacts with the following institutions and in the following ways:

C4D has a range of industrial associates and this group is normally expected to be among sponsors for group and individual thesis projects. This group of industrial partners currently includes Ford, Procter and Gamble, Cisco, Herman-Miller and Royal Mail, and design companies including Imagination Ltd. All group and individual thesis projects are normally expected to be sponsored by a private or public sector partner, although some projects are carried out internally where internal collaborations or particular subject areas are in development.

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This course is accredited formally by the Chartered Society of Designers until 31 July 2024.

2. What are the aims of the course?

This course aims to:
- Equip learners, from a range of design related backgrounds, with the necessary technical and transferable skills, theoretical knowledge, tools and techniques to appreciate the value of design thinking and its application to industrially focused challenges,
- Provide learners with the opportunity to demonstrate and evaluate their new knowledge across a range of different consultancy and research based problems,
- Ensure learners are able to effectively communicate the value of design thinking and its application across industry sectors to inform a diversity of career choices.

This programme is intended for the following range of students:

- Graduates with a high class undergraduate degree in a design related subject who are motivated to develop expertise in the application of design thinking,
- Industry professionals, with a high class undergraduate degree or equivalent industrial experience, who wish to accelerate their career, change career or develop their own business venture through the application of design thinking.

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate in Design Thinking

In completing this course, and achieving the associated award, a diligent student should be able to:

ILO 1. Apply state-of-the-art design tools and processes, to create product and/ or service innovations.

ILO 2. Evaluate the role of design thinking to make formative decisions for industrial competitiveness.

ILO 3. Analyse and deconstruct complex innovation challenges, through best practice design methodologies, to problem solve and facilitate product, service or other innovations.

B. Postgraduate Diploma in Design Thinking

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

ILO 4. Integrate knowledge, understanding and skills from the taught modules in a real-life situation to address problems faced by industrial clients; creating new problems diagnoses, designs or system insights; and communicating findings in a professional manner in written, oral and visual forms.

C. Master of Design in Design Thinking

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

ILO 5. Define research questions, develop aim(s) and objectives, select and execute a methodology, analyse data, evaluate findings critically and draw justifiable conclusions, demonstrating self-direction and originality of thought.

ILO 6. To communicate their individual research via a thesis and in an oral presentation in a style suitable for academic and professional audiences.

4. How is the course taught?

Students will be supported in their learning and personal development by:

Course delivery will be the responsibility of SWEE. A combination of one, two and four week module delivery will be shared between SWEE and the School of Management (SoM). Learners are encouraged to reflect on the experience of this learning at the C4D within the creative modules, the group project, and specifically organised sessions.

There are three phases that make up the course- taught modules, group project/ dissertation and individual thesis project. Learners will be assigned a personal mentor to support their learning and specialism as they progress through the course.

The course applies creative learning methods to provide and to foster an applied design thinking learning experience.

The curriculum will be delivered through the development of a reflective learning and action based approach to maximise the benefit of the multi-disciplinary and applied nature of the course. To support this approach, all phases of the course incorporate formative methods of assessment and feedback in addition to summative assessment and feedback.

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 6. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. Postgraduate Certificate

The accumulation of 60 credits[3] through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Induction week User-centred Design Design, Technology & Prototyping	0 20 20
ELECTIVE MODULES:	
Any of the following modules adding up to an additional 20 credits: Circular Innovation Creative Enterprise & Entrepreneurship Project Management	 10 20 10
TOTAL:	60

B. Postgraduate Diploma

The accumulation of 120 credits[4] through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Induction Week User-centred Design Design, Technology & Prototyping Circular Innovation Creative Enterprise & Entrepreneurship Project Management Group Project (Full Time Students)	0 20 20 10 20 10 40
ELECTIVE MODULES:	
Part Time Students: Group Project OR	40

[3] Senate Regulations require a minimum of 60 learning credits to be accumulated for the Award of PgCert. The number of learning credits for individual courses is set during course validation.

[4] Senate Regulations require a minimum of 120 learning credits to be accumulated for the Award of PgDip. The number of learning credits is set during course validation

Dissertation	40
TOTAL:	120

C. Master of Design

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	**Credits**
COMPULSORY MODULES:	
Induction Week User-centred Design Design, Technology & Prototyping Circular Innovation Creative Enterprise & Entrepreneurship Project Management Group Project (Full Time Students) Thesis	0 20 20 10 20 10 40 80
ELECTIVE MODULES:	
Part Time Students: Group Project OR Dissertation	 40 40
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of ≥50%;
- An average mark of ≥50% across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee); [5]
- **For Taught Assessments,** the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:

[5] Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of <40% (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award (<50%).

- if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of ≥50% across the taught assessments);
- if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
- it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.

- **For Substantial pieces of assessment** (corresponding to ≥40 credits, which are not part of the taught assessment average), the pass mark of ≥50% (where they exist);
- **For the thesis,** a mark of ≥50% in order to receive a pass (where it exists).

6. How is the course structured?

Full-time students register for the course in October and are expected to complete the MDES course within 12 calendar months.

Part-time students register for the course in October and are expected to complete the MDES course within 3 years.

The full time course is structured in three phases:

The taught phase between October and February taking five compulsory modules;
The group project phase runs between February and May;
The thesis project phase runs between May and September.

The part time course is structured in three phases:

The taught phase between October and February taking five compulsory modules (typically within the registration period) over years one and two;

The dissertation phase is organised with a supervisor and typically delivered between years one and two.

The thesis project phase is delivered with a supervisor during year three.

7. Course Level Assessment Strategy[6]

Students on this course will be assessed by a variety of assessments during modules, group project and thesis period. The summative assessment plan for the taught modules owned by the course are outlined in the table below. For the five taught modules, a combination of individual and group coursework, will be used to assess the modules. The assessments have been mapped against the course level ILOs to ensure they cover the core learning across the course. Summative assessment will be complimented by on-going formative assessment and feedback within modules.

Module	***Assessment Details***	***Course Level ILOs***
User-centred Design	Students will need to demonstrate through an individual assignment, using examples of the work conducted as a group,	ILO1, ILO2, ILO3

[6] Guidance to aid colleagues writing or updating a course-level assessment strategy for inclusion in the Course Specification can be found as Appendix K in either the Senate Handbook on Setting up a New Taught Course or the Senate Handbook on Managing Taught Courses https://intranet.cranfield.ac.uk/EducationServices/Pages/SenateHandbooksA-Z.aspx

	their active learning to get qualitative/quantitative data and their analytical skills to get consumer insights. Individual coursework on the success of the project including project outcomes. The assignment should be no more than 6000 words (excluding diagrams, tables and references).	
Design, Technology & Prototyping	An individual report (24 pages) to be written in a scholarly manner, reflecting upon the learnings of the week's module such as: creating a brief/requirements, creative innovation tools, knowledge of technology readiness levels (TRLs), idea generation and the translation of these into new technology propositions through the use of proof of concept prototypes.	ILO1, ILO2, ILO3
Circular Innovation	Individual Course Work - Produce an e-portfolio to document the design process that has been undertaken and present solutions (e-Portfolio Maximum 3000 words using photos and diagrams where appropriate)	ILO1, ILO2, ILO3
Creative Enterprise and Entrepreneurship	The assessment is broken down into two separate summative assessments: Group Coursework (GCW) - 4500 words (10-15 pages): A proposed business plan, and a landing page for a crowdfunding campaign based on a novel entrepreneurial idea generated by the team. (60% of overall module mark). Part time students attending the module will need to commit to engage fully with the group assessment including meeting the published deadline for the group coursework. Individual Coursework (ICW) - (1500 words): Detailing the entrepreneurial process undertaken in developing the ideas including reflection on their role within the team and contribution to the group deliverables. (40% of overall module mark)	ILO1, ILO2, ILO3
Project Management	100% Group Coursework makes up the assessment for this module. The Groupwork requires the completion of the project workbook which is based on the simulation that is undertaken in the module; the workbook allows for the team to reflect on their decisions throughout the simulation. The report will incorporate the teams performance on the simulation.	ILO1, ILO3
Group Project	Group and Individual Course Work - The students work in small consultancy teams typically on a client sponsored project for a period of 10 weeks. The students are responsible for interpreting the brief, developing a project plan, selecting and implementing a methodology, deriving results, analysing the results and drawing conclusions in alignment with the aims and objectives. All students participate in a peer review activity providing them with the opportunity to reflect on the practices of their colleagues as well as their own. Peer review feedback is provided individually by an independent member of academic staff. A single group report is produced and the project is presented orally at the concluding Exhibition Day, both elements are summatively assessed by independent markers and a group mark is assigned for each element. Individual assessment is derived from supervisor observation and meeting minute actions and an individual reflective report where the students reflect on the development of three soft skill competencies based on objectives that they set for themselves. The team working competency is mandatory as one of the three skills for each student.	ILO 4

Dissertation (Part-time students only)	Individual Course Work - Part time students are not required to complete the Group Project undertaken by the full time registered students on a SWEE MSc course. An alternative assignment takes the form of a dissertation or design project which in most situations will be based around a topic relevant to the work of the part-time student. It is evident that some aspects of the Group Project experience that the work-based dissertation replaces – for example the client interaction and group dynamics components will not directly replicated by undertaking this assignment. It is expected that these experiences would normally be a part of the normal working life of the part-time student. It is expected that the dissertation will normally consist of the following elements: Abstract, Background context, Introduction to the theme(s) addressed within the dissertation, setting out the issues that will be covered, Methodology, In depth analysis/discussion of the topics discussed, Concluding remarks, References, Appendices (if relevant). Two supervisors are allocated to the dissertation and supervision follows the model used for the independent research project. The student will submit a 6,000 word report and will give an oral presentation of their work. Both elements of assessment will be marked by independent assessors.	ILO 4
Thesis	Individual Course Work -The individual research project requires students to further develop problem definition, hypothesis setting, select and execute a methodology, analyse data, and evaluate findings and draw appropriate conclusions in the context of research questions relevant to the course followed by a student. The student is required to communicate their findings successfully via a thesis, written in the style of a scientific paper and an oral presentation based around a poster. The projects are designed to integrate knowledge, the taught modules, and apply understanding and skills from the group project, to deliver a high quality written thesis and oral presentation. The individual research project/thesis is typically delivered through collaboration with an industrial sponsor, or it may be an ‘internal’ project reflecting the research interests of the School.	ILO 5 and 6

Course modules

The following modules outline all parts of the programme leading to the MDes in Design Thinking. Other awards associated with the course include some or all of these modules.

Module Number	Module code	Title	Module Leader	Contact hours[7]	Total hours delivered by Visiting Lecturers[8]	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[9] - 40% or 50%	Type of Assessment	Weighting within module[10] (%) of Independent	Weighting within module of multi-part assessments[11]	Type of Assessment	Weighting of individual elements of multi-part assessment[12]	Assessment Submission and/or exam date[13]	Assessment / Exam Retake date
1	I-DES-INWK	Induction week	Adriana Encinas-Oropesa	30		0	N	02/10/23	02/10/23	06/10/23	N/A	AO	N/A				N/A	N/A
2	I-DSL-A1021	User-centred Design	Adriana Encinas-Oropesa	70		20	N	09/10/23	09/10/23	03/11/23	40	ICW	100				FT 04/11/23 PT 18/11/23	May 24

[7] Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice
[8] Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)
[9] A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.
[10] For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education
[11] For **multi-part assessments** please record the overall weighting of module which should be 100%. Multipart assessments should only be included in courses where there is a clear androgogical reason and where each element forms part of a continuous learning and assessment experience for students.
[12] Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate*).* If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.
[13] Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours[7]	Total hours delivered by Visiting Lecturers [8]	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[9] - 40% or 50%	Type of Assessment	Weighting within module[10] (%) of Independent	Weighting within module of multi-part assessments	Type of Assessment	Weighting of individual elements of multi-part assessment[12]	Assessment Submission and/or exam date[13]	Assessment / Exam Retake date
3	I-DES-DTP	Design, Technology and Prototyping	Paul Lighterness	70		20	N	06/11/23	06/11/23	01/12/23	40	ICW	100				FT 02/12/23 PT 06/01/24	May 24
4	I-DFS-A1028	Whole System Design	Enes Unal	37		10	N	04/12/23	04/12/23	15/12/23	40	ICW	100				FT 06/01/24 PT 20/01/24	May 24
5	I-ICI-A1009	Creative Enterprise and Entrepreneurship	Trung Hieu Tran	80		20	N	08/01/24	08/01/24	02/02/24	40	GCW ICW	60 40				FT & PT 03/02/24 FT 10/02/24 PT 17/02/24	May 24
6	M-L/PMI	Project Management Introduction	Chantal Cantarelli	20		10	Y	08/02/24	08/02/24	21/02/24	40	GCW	100				FT/PT 06/03/2024	May 24
7	I-SWEE-GRPP	Group Project	J MacAdam	16		40	Y	26/02/24	26/02/24	03/05/24	50 50 50 50	GCW GPRES ICW RP	64 16 10 10				26/04/24 @ 16:00 23/04/24 @ 16:00 03/05/24 @ 16:00 04/05/24 23:59	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours[7]	Total hours delivered by Visiting Lecturers[8]	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[9] - 40% or 50%	Type of Assessment	Weighting within module[10] (%) of Independent	Weighting within module of multi-part assessments	Type of Assessment	Weighting of individual elements of multi-part assessment[12]	Assessment Submission and/or exam date[13]	Assessment / Exam Retake date
8	I-SWEE-DISS	Dissertation (PT students only)	J MacAdam	10		40	Y	26/02/24	26/02/24	20/09/24	50 50	IPROJ IPRES	80 20				20/09/24 @ 16:00 W/C 23/09/24	Sept 25
9	I-SWEE-THES	Thesis	J MacAdam	20		80	Y	07/05/24	07/05/24	06/09/24	50 50	THESIS OR	90 10				02/09/24 @ 16:00 27/08/24 to 04/09/2024	Sept 2025

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Please list all modules that are used by another existing course.

Module code	**Module title**	**Course that owns the module**	**Other course(s)/ programme(s) that use the module**
M- L/PMI	Project Management Introduction	Logistics and Supply Chain Management	Design Thinking Procurement and Supply Chain Management Exec Logistics and Supply Chain Management
I-SWEE-GRPP	Group Project	School of SWEE	All SWEE courses
I-SWEE-DISS	Dissertation (part time students)	School of SWEE	All SWEE courses
I-SWEE-THES	Individual Research Project	School of SWEE	All SWEE courses

8. How are the ILOs assessed?

The following assessment types are utilised:

Group Presentations, Individual Presentations, Reflective Portfolios, Group Practical's, Individual Practical's, Individual Coursework, Group Coursework, Group Project, Individual Thesis, Formative Assessments

This approach has been adopted because:

This approach has been adopted to reflect the multidisciplinary, multiple output nature of design in industry. The approach will provide learners with the opportunity to communicate their ideas, development, understanding and evaluation in multiple formats to various audiences and give them experiences of working as an individual and as part of a team. Formative assessment and feedback throughout the course will provide learners with guidance and clarify their understanding as they work towards their summative assessments.

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

(Module numbers should correspond with those used in the Course module table above.)

A. Postgraduate Certificate in Design Thinking

Award ILOs / **Module No.**	ILO1	ILO2	ILO3
2	ICW	ICW	ICW
3	ICW	ICW	ICW
4	ICW	ICW	ICW
5	GCW ICW	GCW ICW	GCW ICW
6	GCW		GCW

Award ILOs / Module No.	ILO1	ILO2	ILO3

B. Postgraduate Diploma in Design Thinking

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs / Module No.	ILO4	ILO2	ILO3	ILO4
7				GCW GPRES ICW RP
8				IPROJ IPRES

C. Master of Design in Design Thinking

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs / Module No.	ILO5	ILO6
9	THESIS OR	THESIS OR

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	**Modules Covered**	**Assessment**	
		Type	Weight (%)

9. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who provides authoritative guidance on policy and procedure to the Panel. Proposals are reviewed in line with the UK Quality Code for Higher Education. New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guiding principles to meet the Expectations and Core Practices of the UK Quality Code for Higher Education. External examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the UK Quality Code for Higher Education. The delivery of new partnership provision is ultimately approved by the Universities Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

10. What opportunities are graduates likely to have on completing the course?

The course and C4D produce post-graduates who are able to take leadership positions in the private and public sectors, embedding creative and innovation techniques into all areas. Students will get the opportunity to develop specialisms depending upon their interests, training requirements and desired career paths. They will have ample opportunity to develop their own academic and industrial networks through joining one of C4D's communities of practice in areas such as Breakthrough Innovation, Materials Innovation, Data Driven Innovation or Circular Innovation. Graduates are expected to leave C4D with a

strong idea of their future career goals and an active network of peers, academics and industrialists through which to pursue them.

COURSE SPECIFICATION

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

Date of first publication/latest revision: June 2024

1. What is the course?

Course information

Course Title	Digital and Technology Solutions with specialisms in: Data Analytics (DA) Digital Business and Enterprise (DBE)
Course code	MSDTSPAC, MSDTSPTC, PDDTSPTC, PCDTSPTC
Academic Year	2023 -2024
Valid entry routes	MSc, PgDip, PgCert (Non-Apprenticeship Routes) MSc (Apprenticeship Route only)
Additional exit routes	N/A
Mode of delivery	Part-time
Location(s)[1] of Study	Cranfield University (or client site), and Online
School(s)	School of Aerospace, Transport, and Manufacturing
Theme	Manufacturing
Centre	Digital Engineering and Manufacturing
Course Director	John Erkoyuncu
Awarding Body	Cranfield University
Is this an AP Contract course?[2]	No
Is this course offered as a Cranfield Apprenticeship?	Yes
Apprenticeship Standard the course is mapped to	Digital and Technology Solutions Specialist (Integrated Degree) • Data Analytics Specialist; • Digital Business and Enterprise Systems Architecture Specialist
Is the Degree apprenticeship integrated or non-integrated?	Integrated

[1] If any part of this course is delivered at another site, please note which one(s) here
[2] AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Is the Apprenticeship offered as an open and/or closed course?	Open and closed
Teaching Institution	Cranfield University
Admissions body	Cranfield University
Entry requirements	Standard University entry requirements
UK Qualifications Framework Level	QAA FHEA Level 7 Masters
Benchmark Statement(s)	N/A
Registration Period(s) available	24 months
Course Start Month(s)	Apprenticeship: October and February Non-Apprenticeship: January (new permanent annual intake from Jan 25 following intake deferral from August 24).

Institutions delivering the course

This course is delivered by the School of Aerospace, Transport and Manufacturing, and within the Manufacturing theme it is led by the Centre for Digital Engineering and Manufacturing where the research interests include:

Business intelligence, digitalisation of manufacturing and service processes, modelling and optimisation of complex systems, digital twins, artificial intelligence, visualisation using virtual and augmented reality, system test and assurance.

Cranfield University interacts with the following institutions and in the following ways:

NA

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This course is not accredited by any external bodies.

It is intended to apply to the IET and IMechE for professional accreditation in the future. All module ILOs have been designed with cognisance of AHEP requirements.

2. What are the aims of the course?

The Digital and Technology Solutions MSc programme takes a holistic view to offer awareness and hands-on practical knowledge to design and develop digital technologies and solutions (including AI/Machine learning, digital twins, AR/VR, data analytics, data management) across industries that rely on complex engineered products and services. The course blends technical and managerial skills to promote the creation, adoption, and evolution of digital technologies and solutions. The course has been developed bearing in mind a number of contextual challenges faced in manufacturing and maintenance of complex engineered assets as noted below:

- While manufacturers are aware of the benefits of Integrated Digital Technologies (IDTs), MakeUK has found 44% are not yet adopting them.
- Since 2018 digital skills and data compatibility have remained unchanged as the top two barriers of adoption.

- Whilst German manufacturing productivity grew by 6% between 2000 and 2015, UK productivity decreased by 6.1% (McKinsey Global Institute analysis).

Through our own engagement with over twenty organisations across industry sectors such as defence, aerospace, rail, and wider manufacturing we have identified numerous needs for skills development:

- Business challenges - Relating technology application to strategic aims and business value, as well as understanding human-machine interactions. Achieving this by aligning opportunity to strategic vision and generating near-term value.
- Data acquisition and integration challenges by managing data pipelines, ensuring quality and assurance and integrating different types of models that truly represent the physical counterpart- through systems of systems thinking.
- Application of analytics models requires cultural and technical challenges to be addressed in their design and development.
- Enterprise networks all the way to micro service architectures will be key to through-life optimisation and bringing innovative digital services to market.
- Trust and ethical considerations in decision making and autonomy of systems requires robust assurance and regulatory alignment

This course offers to develop skills and aims to contribute to a 20% improvement in each of the areas of: asset/process performance, overall costs and environmental impact. We aim to contribute to creating a dynamic workforce, where each individual may influence the future of their organisation in areas such as design, manufacturing and maintenance. By allowing individuals to have oversight of the entirety of value-added processes, their long-term position will be secured as job roles evolve.

The Digital and Technology Solutions MSc programme is aligned to the Digital and Technology Solutions Standard (https://www.instituteforapprenticeships.org/apprenticeship-standards/digital-and-technology-solutions-specialist-integrated-degree/) set by the Institute for Apprenticeships and Technical Education and the levy covers the tuition fees for those eligible. The design of the Course has applied Ofsted 3 I's to meet the Apprenticeship Standard:

- Intent (what and why): we established the focus and reasoning behind the course through extensive engagement with industry. The Course has an ambitious target to close numerous skills gaps in digital engineering to improve on targets such as productivity, sustainability and commercial gains.
- Implication (how): students on the course will be able to design and develop digital technology and solutions to address challenges and create new opportunities.
- Impact: students will be able to transform the way organisations operate by embedding digital transformation at the heart of change. This will lead to impact in numerous areas such as performance improvements, commercial gains, and environmental enhancements.

The course is open to both Apprenticeship and non-Apprenticeship applicants. On entry, Apprentices have to choose one of two available specialism routes in the MSc: 'Data Analytics Specialist' or 'Digital Business and Enterprise Systems Architecture Specialist'. Apprentices must fulfil the set of Knowledge, Skills and Behaviours (KSB) aligned to the specialism selected and must also complete an End-Point Assessment (EPA). Non-apprenticeship students do not need to select a specific specialism and will have flexibility to select 2 modules from the 4 elective options.

The delivery of the course will rely on innovative approaches such as problem-based learning (PBL), blended learning methods. PBL will be delivered through case studies developed with industry that focus on digitalisation challenges and opportunities related to complex engineered products and services related to sectors such as defence, aerospace, rail, and nuclear. The case studies will provide the architecture to facilitate learning throughout the modules as students explore alternative routes to solve the challenges set. Blended learning refers to the combination of face-to-face and online collaboration during modules that are delivered face to face (Modules 1 and 8). As an example, we will organise group activities that can utilise online collaboration with external experts and will also have face-to-face engagement on alternative tasks. We will also pay due attention to Prevent, Safeguarding and British Values, in respect of upskilling. In the Course Induction and Module 1 we will introduce skills needed to recognise and prevent radicalization and extremism, the principles of safeguarding, the prevent duty and

its importance in society, and the importance of online safety and British values. The lessons to be learned will be reinforced throughout the course through the Course Director, Module Leaders, Tutor, Academic Supervisors, and module lecturers. We will highlight that understanding safeguarding and prevention can benefit the wider safeguarding practices within the workplace. The embedding of English and Maths will be through the taught modules and assignments.

The course will significantly improve the career prospects of students as they will be equipped with the skills to not only choose the right digital technologies and solutions across the life cycle of complex engineered assets, but also be able to apply their knowledge to create solutions to address significant challenges.

The course is designed to enable digital transformation across organisations, and it will promote numerous opportunities to enhance commercial gains, improve productivity, and contribute to sustainability.

This programme is intended for the following range of students:

The course has been designed for industry professionals in a way that fits around demanding careers. Furthermore, the course aims to develop skills to lead change in business through digital technologies and processes. The candidates will be employed by an organisation and will be able to undertake work-based projects related to their specialism or topic of interest. For those who recognise the potential for a long and successful career utilising digital technologies and solutions across the different phases of the life cycle for complex engineered assets. This course addresses the need for highly trained professionals that rely on digital technologies and solutions required to transform operations into a world-class business in all sectors of manufacturing and is suitable for:

- Experienced professionals who are seeking or are progressing to senior leadership roles within manufacturing or related sectors.
- Early and mid-career professionals who want a “real-world” based education that they can apply directly to their workplace.
- Second career professionals seeking a change into manufacturing/maintenance-related or digitally driven organisation.

Employer engagement is critical for this course in order to make it a win-win experience for the organisation as well as the individual on the Course. We have planned regular touch points between the Tutor (for Apprenticeship and non-apprenticeship students), Course Director, Industrial Sponsor and Student to enable the development of a plan and to ensure the impactful delivery of the MSc journey together. For apprenticeship students, these meetings will focus on planning and evaluating the KSBs that have to be demonstrated within the workspace. As part of these meetings, we will also review and ensure we comply with the apprenticeship off-the-job requirements as noted by the new ESFA funding rules on taught hours. For non-apprenticeship tutors we will hold similar meetings to empower the students in the MSc journey with respect to their learning experience and achieving impact in their organisations. Employers will have the opportunity to influence the Group project, Individual Practical Project, and the assignments on the modules. In this process we will explore opportunities for maximum value-added outcomes from the Course. For the Student, we will aim to align the Course to their career aspirations and offer a bespoke experience for skills development.

The student workload is an important element to consider, which we have taken steps to make the MSc experience both fulfilling and impactful. The course aims to support students by aligning their day-to-day work with the MSc commitments. In parallel to regular academic feedback, there will be the Tutor to support students, through regular meetings, in realising opportunities to apply the learning, and in providing feedback on progress. This will come primarily from a practical perspective and will be centred on progressing on the personal and organisational aspirations. There will be no overlap between the assignment and the delivery of the following module in the Course in order to support workload commitments. Further details on how student workload has been considered has been visualised in Annex C.

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate (PgCert):

In completing this course, and achieving the associated award, a diligent student should be able to:

ILO 1. Justify the need for digital technologies and solutions in light of specific organisational goals;
ILO 2. Compare and contrast digital technologies and solutions with the intent to design solutions within enterprise boundaries;
ILO 3. Evaluate modelling approaches, and develop integrated simulation models for complex digital transformation targets.

B. Postgraduate Diploma (PgDip):

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

ILO 4. Critically evaluate the need for data and justify the journey that data takes from acquisition, to distribution, to use and to storage with a view to derive enterprise-level value;
ILO 5. Select suitable modelling approaches, and apply alternative methods to address key decisional challenges and evaluate the impact attained;
ILO 6. In groups, evaluate and develop a plan for workplace transformation through the implementation of digital technology and solutions;

C. MSc

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

ILO 7. Evaluate alternative means to communicate results from qualitative and quantitative analysis and develop visualisation methods for different types of stakeholders to interact with results
ILO 8. Critically evaluate operational and strategic approaches to developing integrated digital technology and solutions;
ILO 9. Justify robust digital technology and solutions through test and assurance methods.

4. How is the course taught?

Students will be supported in their learning and personal development by a number of people including the Course Director, Student Administrative Support Lead, Module Leaders, Apprenticeship Tutor, relevant lecturers on modules, and Academic Supervisors on Group and Individual Projects. Students will also have the opportunity to learn from our Careers Service Team and engage with the wider Alumni office.

The course is composed of three core parts:

1) For L7 apprenticeship students there are eight compulsory taught modules spread between months 1-16; for the non-apprenticeship students there are six compulsory taught modules and two electives.
2) Group project between months 6-12, including 4-6 people working on a project that is relevant, and impactful typically to the day-to-day job;
3) Individual practical project (IPP – For apprentices) / Individual research project (IRP – Non-apprentices). The student, in collaboration with the employer and the University will determine an Individual Project that is aligned to the day-to-day job and offers to make a significant impact on the business. This business-related project will run between months 14-24 and will be written-up

as a report between months 21-24. During months 20-21 time will be allocated to the gateway assessments (for apprentices) and presentation preparation (for non-apprenticeship students). Apprenticeship students will need to complete the End-Point Assessment between months 21-24.

Apprenticeship students, throughout the whole course, will need to provide evidence on the KSBs. KSBs are mapped for each credit-bearing part of the study and students will need to reflect on their learning and demonstrate how they have been able to make an impact in their organisation according to this mapping. The EPA element will be assessed through the individual practical project report and the professional discussion. In the report, students will need to highlight how each KSB has been addressed. Similarly, in the professional discussion, the KSBs need to be evidenced through a portfolio of evidence. The Apprenticeship students will quarterly have Tripartite meetings with their Apprenticeship Tutor, and their Company Sponsor to discuss their progress against the KSBs, and will have the opportunity to reflect on their learning and the impact that they are making in the Sponsor organisation. As the EPA Organisation, Cranfield takes on the following responsibilities: 1) provide an apprenticeship tutor for each student to undertake the quarterly Tripartite meetings throughout the course, 2) manage the gateway assessment for each student, 3) manage the EPA delivery with at least two independent assessors that have not been involved in the Course and 4) facilitate lectures and projects that will enable students to fulfil the required KSBs for each specialism.

The induction module will be delivered face to face, but there will be opportunities to join online. All modules will be delivered based on PBL. This is an important point for the delivery of the course, to provide challenges, which have been co-designed with industry, to provide a central focus to each taught module. Taught modules 1 and 8 ('Introduction to Digital Engineering' and 'Digital integration and System Testing') will be delivered wholly face to face. In Module 1 will introduce PBL and promote networking across the cohort. Module 8 will be face-to-face to deliver an integrated digital solution, which will require very close engagement on physical and digital assets. The PBL approach will offer a flipped classroom engagement style where students will have the opportunity to investigate, explore, and collaborate in the process of solving problems through case studies. Accordingly, each module will be systematically structured around a significant industrial challenge (or a set of challenges) that is relevant to the particular module. Industrial challenges have been developed through a series of workshops with over 20 organisations to capture common cross-organisational challenges that are impactful commercially and technically. In PBL, the interaction between the lecturer and students will be enabled by applying a range of methods including case studies, experiments, storyboards, questionnaires developed by students to interact with experts, mind maps, interactive graphs, AR/VR, simulation models, worked examples, and tutorials. Sessions will be tackled based on group discussions, research and guidance provided by the module leader or lecturers. The guidance will be offered in various formats whether it be recorded videos to be viewed prior to or during the module, live presentations on particular points, supplementary content such as academic papers and industrial white papers or open discussions. Modules 2-7 will be delivered through distance learning, with both live lectures/interaction through an online portal and recorded material (e.g., videos) will be shared through the VLE.

Students will work in groups to address the challenges set through PBL in each module. A series of live face-to-face/online and recorded guidance material including technical lectures will facilitate the student's process of addressing the set challenges. The group activity within modules will not be graded, but it will serve as formative assessment. The feedback on this by lecturers and the Module Leader will help the students to prepare the assignment that forms the module-level summative assessment. Across the modules students will progressively work on the development of an integrated digital technology and solution for an industrially led challenge. This will not be graded and will be part of the formative assessment within the modules. The sequence of modules has purposefully been constructed in order to build the integrated solution in a modular manner. The individual project is an individualistic study that promotes on-the-job learning alongside independent self-study to solve an industrial challenge focused on the digital technology and solution creation. These challenges will typically be strategic or operational in nature and will be value driven based on the impact that a digital technology or solution can make.

Students will engage regularly (e.g., around every 3 months) with a course independent tutor who will have the role of facilitating implementation of new knowledge in the workplace and to clarify any on-going queries. For apprentices, the tutor will also provide guidance with the process of evidencing the required KSBs necessary for the Gateway in Month 20 of the programme. The tutor will also provide the

opportunity to engage with the Industrial Line Manager / Sponsor to offer a path for effective organisational impact from the course. Students will also have up to two academic supervisors to guide with the research and direction of studies during their group and individual project components.

In the case where resits are required, the course has been designed to allow flexibility. Modules will be completed between M1-16. If a resit is required for a module, we commit to offering a flexible route to conduct the new assessment based on feasible dates offered by the student and the Module Leader. Resits for group projects will be through the next available cohort. Resits for Individual Practical Projects will also be turned around in a timeline that aligns with the student's availability.

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 6. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. Postgraduate Certificate

The accumulation of 60 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Induction Modules 1-4,	0 40
ELECTIVE MODULES:	
Any 2 modules from 5, 6, 7, 8, 9 or 10	20
TOTAL:	**60**

B. Postgraduate Diploma

The accumulation of 120 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Induction Modules 1-4, 7 and 8 Group Project (Module 11)	0 60 40
ELECTIVE MODULES:	
Any 2 modules from 5, 6, 9 or 10	20
TOTAL:	**120**

C. MSc

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

APPRENTICESHIP STUDENTS

Digital Business and Enterprise specialism

Description:	Credits
COMPULSORY MODULES:	
Induction (Module 0) Modules 1-4, and 7-10 Group Project (Module 11) Individual Practical Project (Module 14)	0 80 40 80
TOTAL:	**200**

Data Analytics specialism

Description:	Credits
COMPULSORY MODULES:	
Induction (Module 0) Modules 1-8 Group Project (Module 11) Individual Practical Project (Module 13)	0 80 40 80
TOTAL:	**200**

NON-APPRENTICESHIP STUDENTS

Description:	**Credits**
COMPULSORY MODULES:	
Induction (Module 0) Modules 1-4, 7 and 8 Group Project (Module 11) Individual Research Project (Module 12)	0 60 40 80
ELECTIVE MODULES:	
Any 2 modules from 5, 6, 9 or 10	20
TOTAL:	**200**

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria
The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of ≥50%;
- An average mark of ≥50% across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of

your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee); [3]

- **For Taught Assessments,** the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
  - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of ≥50% across the taught assessments);
  - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
  - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥40 credits, which are not part of the taught assessment average), the pass mark of ≥50% (where they exist);
- **For the thesis,** a mark of ≥50% in order to receive a pass (where it exists).

6. How is the course structured?

The course is planned as a 24-month programme. There are three main parts to the course:

1) For L7 apprenticeship students there are eight compulsory taught modules between months 1-16; for the non-apprenticeship students there are six compulsory modules and two electives - 80 credits – 10 for each module.
2) Group project - 40 credits between months 6-12.
3) Individual practical project (for apprenticeship students) / Individual Research Project (Non-apprenticeship students) - 80 credits between months 14-24.

The course aligns with the level 7 Digital and Technology Solutions Specialist (Integrated Degree) with the Data Analytics Specialist and Digital Business & Enterprise Systems Architecture Specialist occupational streams as course specialisms, which align with the KSBs noted in the Apprenticeship standard. For apprentices, the Gateway will typically be managed between months 20-21.

The course Induction is not credit-bearing but will provide the basis of the course and explain the key terms and ways of working in the course. All taught modules will be structured in PBL format.

Modules titled 'Introduction to Digital Engineering' (first taught module) and 'Digital integration and Systems Test' (last taught module) will be delivered face to face over a 5-day duration between Monday to Friday. The remaining six modules will be delivered online over a 5-day duration from Wednesday-Tuesday as we will provide the weekend as a break during each of these modules. For the online delivery, we will use collaborative virtual platforms that enable group activities, and the ability to share documents and jointly work on alternative problems. The Course will benefit from the intended mixed delivery format of face-to-face and online delivery, as we will be able to represent hybrid work environments being increasingly adopted across industry and provide the opportunity to develop communication skills in a variety of contexts.

The module delivery follows a step-by-step process to create an integrated digital technology and solution. The sequence of the modules resembles a typical process for new product development with the following structure: a) evaluate the need, and commercially justify the technology and solution, b)

[3] Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of <40% (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award (<50%).

design the technology in relation to organisational constraints, c) develop technology and solution with value creation at the heart of decisional capability to be created, and d) integrating and testing the developed technology and solution. The integrated technology and solution will be one of the significant outputs from the students on the course and is expected to offer major industrial improvements in sponsor organisations. The specific focus of the integrated technology and solution (output of the formative assessments across the modules) to be developed at the end of the modules will be agreed between the Course Director, student and the Sponsor before the first module. Furthermore, the integrated solution from the modules will be different to the individual project.

The group project will consist of 4-6 students working for 6 months between months 6-12 on an industrially relevant project. The group project will be defined within the first 3 months of the course in collaboration with the sponsors. We will typically have students from multiple organisations to work on the same group project. However, if an organisation prefers a project with solely their staff in a group, we will be able to offer that option wherever possible. A range of group projects will be made available to students to select from. The outcome of the project is expected to be a digital technology and solution.

The Individual Practical Project (apprenticeship student) / Individual Research Project (non-apprentice student) will involve developing a new industry-scale digital technology or solution. The project will typically be aligned to the students' day-to-day job, and it will focus on addressing a major challenge, or creating a new improvement opportunity. The individual project will be defined between months 12-14 in agreement between the Course Director, Group Project Module Leader, the Industrial Sponsor / Line Manager and the student.

7. Course Level Assessment Strategy[4]

The assessment tasks are challenging and enable students to demonstrate a full range of skills and attributes. The taught modules will introduce students to a range of digital technologies and will be assessed through a number of types of assessments including ‘essay’, ‘proposal or bid’, ‘report’ or ‘practical work’. Each of the modules will set challenges for students to solve whether it be a strategic proposal, or a technical technology or solution, which will be communicated through various means such as a write-up, video, simulation etc. Students will write employability relevant policy briefing documents to equip them with the skills they require to succeed in and to address the specific ILOs. Students then have opportunities to develop their communication skills, as they are required to give a group presentation and individual presentation.

The ability to work effectively in groups is a highly desirable skill which has been reflected in the course level ILOs. Taught modules are supported by a number of formative tasks including group discussion, case studies, and oral presentations. Formative feedback is given immediately after the group presentation within the module. Students will also engage with an interactive learning activity, which incorporates formative feedback. Some taught modules will overlap with the Group Project, and Individual Practical Project/Individual Research Project. Students are generally expected to be more self-directed in their learning although guidance will be provided through academic supervision and the Tutor.

[4] Guidance to aid colleagues writing or updating a course-level assessment strategy for inclusion in the Course Specification can be found as Appendix K in either the Senate Handbook on Setting up a New Taught Course or the Senate Handbook on Managing Taught Courses https://intranet.cranfield.ac.uk/EducationServices/Pages/SenateHandbooksA-Z.aspx

Course modules

The following modules outline all parts of the programme leading to MSc. Other awards associated with the course include some or all of these modules.

Timetable for October 2022 (Closed MSc) Cohort:

Module Number	Module code	Title	Module Leader	Contact hours[5]	Total hours delivered by Visiting Lecturers [6]	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[7] - 40% or 50%	Type of Assessment	Weighting within module[8] (%) of	Weighting within module of multi-part	Type of Assessment	Weighting of individual elements of multi-part	Assessment Submission and/or exam date[11]	Assessment / Exam Retake date
6	I-DAT-DAAI *Occ A23*	Data Analytics and Artificial Intelligence	Samir Khan	32		10	N	30/08/2023	I-DAT-DAAI *Occ A23*	Data Analytics and Artificial Intelligence	50	ICW	100				10/10/23	Re-assessment date to be set by agreement of the Module Leader as/when required.
7	I-DAT-AV *Occ A23*	Adaptive visualisation	Sam Court	32		10	N	04/10/2023	I-DAT-AV *Occ A23*	Adaptive visualisation	50	ICW	100				14/11/23	Re-assessment date to be set by agreement of the

[5] Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice
[6] Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)
[7] A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.
[8] For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education.
[9] For **multi-part assessments** please record the overall weighting of module which should be 100%. Multipart assessments should only be included in courses where there is a clear andragogical reason and where each element forms part of a continuous learning and assessment experience for students.
[10] Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate*).* If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.
[11] Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours[5]	Total hours delivered by Visiting Lecturers [6]	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[7] - 40% or 50%	Type of Assessment	Weighting within module[8] (%) of	Weighting within module of multi-part	Type of Assessment	Weighting of individual elements of multi-part	Assessment Submission and/or exam date[11]	Assessment / Exam Retake date
																		Module Leader as/when required.
8	I-DAT-DIST *Occ A23*	Digital integration and System Testing	Sam Court	32		10	N	13/11/2023	20/11/2023	24/11/2023	50	ICW	100				16/01/2024	Re-assessment date to be set by agreement of the Module Leader as/when required.
9	I-DAT-DESA *Occ A22*	Digitally Enabled Servitisation	John Erkoyuncu					This module is not being offered to the October cohort for AY 2022-23										
10	I-DAT-DCE *Occ A23*	Digitalisation of Cost Engineering	Maryam Farsi					This module is not being offered to the October cohort for AY 2022-23										
12	I-DAT-IRP *Occ A23*	Individual Research Project	Samuel Court	80		80	N	20/11/2023	15/01/2024	16/09/2024	50 50	THESIS IPRES	75 25				16/09/2024 23/09/2024	As recommended by the Board of Examiners
13	I-DAT-IPPDA Occ A23	Individual Practical Project (Data Analytics Specialist)	Samuel Court	80		80	N	This Module is not available to NON Apprenticeship students										
14	I-DAT-IPPBE	Individual Practical	Samuel Court	80		80	N	This Module is not available to NON Apprenticeship students										

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours[5]	Total hours delivered by Visiting Lecturers [6]	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[7] - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module[8] (%) of	Weighting within	Type of Assessment	Weighting of individual	Assessment Submission and/or exam date[11]	Assessment / Exam Retake date
	Occ A23	Project (Digital Business and Enterprise Systems Architecture Specialist)																

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Timetable for November 2022 (Open MSc and Apprenticeship) Cohort:

Module Number	Module code	Title	Module Leader	Contact hours[12]	Total hours delivered by Visiting Lecturers[13]	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Module Number	Type of Assessment	Weighting within module[14] (% of Independent assessments	Weighting within module of multi-part assessments[15](100%)	Type of Assessment	Weighting within module[16] (%) of Independent assessments	Weighting within module of multi-part assessments[17](100%)	Type of Assessment
6	I-DAT-DAAI *Occ B23*	Data Analytics and Artificial Intelligence	Samir Khan	32		10	N	27/09/2023	04/10/2023	10/10/2023	50	ICW	100				06/11/2023	Re-assessment date to be set by agreement of the Module Leader as/when required.
7	I-DAT-AV *Occ B23*	Adaptive visualisation	Sam Court	32		10	N	01/11/2023	08/11/2023	14/11/2023	50	ICW	100				11/12/2023	Re-assessment date to be set by agreement of the Module Leader as/when required.

[12] Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice
[13] Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)
[14] For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education.
[15] For **multi-part assessments** please record the overall weighting of module which should be 100%. Multipart assessments should only be included in courses where there is a clear andragogical reason and where each element forms part of a continuous learning and assessment experience for students.
[16] For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education.
[17] For **multi-part assessments** please record the overall weighting of module which should be 100%. Multipart assessments should only be included in courses where there is a clear andragogical reason and where each element forms part of a continuous learning and assessment experience for students.

8	I-DAT-DIST *Occ B23*	Digital integration and System Testing	Sam Court	32		10	N	05/12/2023	11/12/2023	15/12/2023	50	ICW	100				08/01/2024	Re-assessment date to be set by agreement of the Module Leader as/when required.
10	I-DAT-DCE *Occ B23*	Digitalisation of Cost Engineering	Maryam Farsi	32		10	N	27/09/2023	04/10/2023	10/10/2023	50	ICW	100				06/11/2023	Re-assessment date to be set by agreement of the Module Leader as/when required.
11	I-DAT-GP *Occ B22*	Group Project	Samir Khan	24		40	N	12/04/2023	19/04/2023	02/10/2023	50 50 50	GCW GPRES ICW	64 16 20				02/10/2023 06/10/2023 02/10/2023	
12	I-DAT-IRP *Occ B23*	Individual Research Project	Samuel Court	80		80	N	20/11/2023	15/01/2024	16/09/2024	50 50	THESIS IPRES	75 25				16/09/2024 23/09/2024	As recommended by the Board of Examiners
13	I-DAT-IPPDA *Occ B23*	Individual Practical Project (Data Analytics Specialist)	Samuel Court	80		80	N	15/01/2024	15/01/2024	15/07/2024	50 50	ICW OR	75 25				10/09/2024 07/10/2024	As recommended following End-Point Assessment
14	I-DAT-IPPBE *Occ B23*	Individual Practical Project (Digital Business and Enterprise Systems Architecture Specialist)	Samuel Court	80		80	N	15/01/2024	15/01/2024	15/07/2024	50 50	ICW OR	75 25				10/09/2024 07/10/2024	As recommended following End-Point Assessment

Timetable for August 2023 (Closed MSc) cohort:

Module Number	Module code	Title	Module Leader	Contact hours[18]	Total hours delivered by Visiting Lecturers[19]	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[20] - 40% or 50%	Type of Assessment	Weighting within module[21] (%) of	Weighting within module of multi-part	Type of Assessment	Weighting of individual elements of multi-part	Assessment Submission and/or exam date[24]	Assessment / Exam Retake date
0	I-DAT-IND *Occ C*	Induction	John Erkoyuncu	21		0	N	02/08/2023	02/08/2023	04/08/2023		AO						
1	I-DAT-IDE *Occ C*	Introduction to Digital Engineering	John Erkoyuncu	32		10	N	07/08/2023	07/08/2023	11/08/2023	50	ICW	100				05/09/2023	Re-assessment date to be set by agreement of the Module Leader as/when required.
2	I-DAT-DBES *Occ C*	Digital Business & Enterprise Systems	Pavan Addepalli	32		10	N	30/08/2023	06/09/2023	12/09/2023	50	ICW	100				10/10/2023	Re-assessment date to be set by agreement of the Module Leader as/when required.
3	I-DAT-DT *Occ C*	Digital Twins	Bernadin Namoano	32		10	N	04/10/2023	11/10/2023	17/10/2023	50	ICW	100				14/11/2023	Re-assessment date to be set by agreement of the

[18] Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice
[19] Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)
[20] A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.
[21] For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education.
[22] For **multi-part assessments** please record the overall weighting of module which should be 100%. Multipart assessments should only be included in courses where there is a clear andragogical reason and where each element forms part of a continuous learning and assessment experience for students.
[23] Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate*).* If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.
[24] Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Module Number	Module code	Title	Module Leader	Contact hours[18]	Total hours delivered by Visiting Lecturers [19]	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[20] - 40% or 50%	Type of Assessment	Weighting within module[21] (%) of	Weighting within	Type of Assessment	Weighting of individual	Assessment Submission and/or exam date[24]	Assessment / Exam Retake date
																		Module Leader as/when required.
4	I-DAT-IDM *Occ C*	Integrated Data Management	Christina Latsou	32		10	N	08/11/2023	15/11/2023	21/11/2023	50	ICW	100				04/01/2024	Re-assessment date to be set by agreement of the Module Leader as/when required.
5	I-DAT-DBA *Occ C*	Digital Business Analysis	Maryam Farsi	32		10	N	28/02/2024	06/03/2024	12/03/2024	50	ICW	100				09/04/2024	Re-assessment date to be set by agreement of the Module Leader as/when required.
6	I-DAT-DAAI *Occ C*	Data Analytics and Artificial Intelligence	Samir Khan	32		10	N	03/04/2024	10/04/2024	16/04/2024	50	ICW	100				14/05/2024	Re-assessment date to be set by agreement of the Module Leader as/when required.
7	I-DAT-AV *Occ C*	Adaptive visualisation	Sam Court	32		10	N	15/05/2024	22/05/2024	28/05/2024	50	ICW	100				18/06/2024	Re-assessment date to be set by agreement of the Module Leader as/when required.
8	I-DAT-DIST *Occ C*	Digital integration and System Testing	Sam Court	32		10	N	17/06/2024	24/06/2024	28/06/2024	50	ICW	100				26/07/2024	Re-assessment date to be set by agreement of the Module Leader as/when required.
9	I-DAT-DESA *Occ C*	Digitally Enabled Servitisation	John Erkoyuncu	32		10	N	28/02/2024	06/03/2024	12/03/2024	50	ICW	100				09/04/2024	Re-assessment date to be set by agreement of the

Module Number	Module code	Title	Module Leader	Contact hours[18]	Total hours delivered by Visiting Lecturers [19]	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[20] - 40% or 50%	Type of Assessment	Weighting within module[21] (%) of	Weighting within	Type of Assessment	Weighting of individual	Assessment Submission and/or exam date[24]	Assessment / Exam Retake date
																		Module Leader as/when required.
10	I-DAT-DCE *Occ C*	Digitalisation of Cost Engineering	Maryam Farsi	32		10	N	03/04/2024	10/04/2024	16/04/2024	50	ICW	100				14/05/2024	Re-assessment date to be set by agreement of the Module Leader as/when required.
11	I-DAT-GP *Occ C*	Group Project	Samir Khan	24		40	N	10/01/2024	10/01/2024	01/07/2024	50 50 50	GCW GPRES ICW	64 16 20				01/07/2024 04/07/2024 01/07/2024	
12	I-DAT-IRP *Occ C*	Individual Research Project	Samuel Court	80		80	N	29/07/2024	09/09/2024	12/05/2025	50 50	THESIS IPRES	75 25				12/05/2025 19/05/2025	As recommended by the Board of Examiners
13	I-DAT-IPPDA *Occ C*	Individual Practical Project (Data Analytics Specialist)	Samuel Court	80		80	N	This Module is not available to NON Apprenticeship students										
14	I-DAT-IPPBE *Occ C*	Individual Practical Project (Digital Business and Enterprise Systems Architecture Specialist)	Samuel Court	80		80	N	This Module is not available to NON Apprenticeship students										

Timetable for October 2023 (Open MSc and Apprenticeship) Cohort:

Module Number	Module code	Title	Module Leader	Contact hours[25]	Total hours delivered by Visiting Lecturers [26]	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[27] - 40% or 50%	Type of Assessment	Weighting within module[28] (%) of	Weighting within module of multi-part	Type of Assessment	Weighting of individual elements of multi-part	Assessment Submission and/or exam date[31]	Assessment / Exam Retake date
0	I-DAT-IND *Occ A23*	Induction	John Erkoyuncu	21		0	N	10/10/2023	10/10/2023	12/10/2023		AO						
1	I-DAT-IDE *Occ A23*	Introduction to Digital Engineering	John Erkoyuncu	32		10	N	16/10/2023	23/10/2023	27/10/2023	50	ICW	100				20/11/2023	Re-assessment date to be set by agreement of the Module Leader as/when required.
2	I-DAT-DBES *Occ A23*	Digital Business & Enterprise Systems	Pavan Addepalli	32		10	N	15/11/2023	22/11/2023	28/11/2023	50	ICW	100				08/01/2024	Re-assessment date to be set by agreement of the Module Leader as/when required.
3	I-DAT-DT	Digital Twins	Bernadin Namoano	32		10	N	03/01/2024	10/01/2024	16/01/2024	50	ICW	100				12/02/2024	Re-assessment date to be set by

[25] Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice
[26] Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)
[27] A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.
[28] For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education.
[29] For **multi-part assessments** please record the overall weighting of module which should be 100%. Multipart assessments should only be included in courses where there is a clear andragogical reason and where each element forms part of a continuous learning and assessment experience for students.
[30] Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate*).* If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.
[31] Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Module Number	Module code	Title	Module Leader	Contact hours[25]	Total hours delivered by Visiting Lecturers [26]	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[27] - 40% or 50%	Type of Assessment	Weighting within module[28] (%) of	Weighting within module of multi-part	Type of Assessment	Weighting of individual elements of multi-part	Assessment Submission and/or exam date[31]	Assessment / Exam Retake date
	Occ A23																	agreement of the Module Leader as/when required.
4	I-DAT-IDM *Occ A23*	Integrated Data Management	Christina Latsou	32		10	N	07/02/2024	14/02/2024	20/02/2024	50	ICW	100				18/03/2024	Re-assessment date to be set by agreement of the Module Leader as/when required.
5	I-DAT-DBA *Occ A23*	Digital Business Analysis	Maryam Farsi	32		10	N	08/05//2024	15/05/2024	21/05/2024	50	ICW	100				17/06/2024	Re-assessment date to be set by agreement of the Module Leader as/when required.
6	I-DAT-DAAI *Occ A24*	Data Analytics and Artificial Intelligence	Samir Khan	32		10	N	21/08/2024	28/08/2024	03/09/2024	50	ICW	100				30/09/2024	Re-assessment date to be set by agreement of the Module Leader as/when required.
7	I-DAT-AV *Occ A24*	Adaptive visualisation	Sam Court	32		10	N	25/09/2024	02/10/2024	08/10/2024	50	ICW	100				04/11/2024	Re-assessment date to be set by agreement of the Module Leader as/when required.
8	I-DAT-DIST *Occ A24*	Digital integration and System Testing	Sam Court	32		10	N	30/10/2024	11/11/2024	15/11/2024	50	ICW	100				16/12/2024	Re-assessment date to be set by agreement of the Module Leader as/when required.
9	I-DAT-DESA	Digitally Enabled Servitisation	John Erkoyuncu	32		10	N	08/05//2024	15/05/2024	21/05/2024	50	ICW	100				17/06/2024	Re-assessment date to be set by agreement of the

Module Number	Module code	Title	Module Leader	Contact hours[25]	Total hours delivered by Visiting Lecturers[26]	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[27] - 40% or 50%	Type of Assessment	Weighting within module[28] (%) of	Weighting within module of multi-part	Type of Assessment	Weighting of individual elements of multi-part	Assessment Submission and/or exam date[31]	Assessment / Exam Retake date
	Occ A23																	Module Leader as/when required.
10	I-DAT-DCE *Occ A24*	Digitalisation of Cost Engineering	Maryam Farsi	32		10	N	21/08/2024	28/08/2024	02/09/2024	50	ICW	100				30/09/2024	Re-assessment date to be set by agreement of the Module Leader as/when required.
11	I-DAT-GP *Occ A23*	Group Project	Samir Khan	24		40	N	13/03/2024	13/03/2024	02/09/2024	50 50 50	GCW GPRES ICW	64 16 20				02/09/2024 06/09/2024 02/09/2024	
12	I-DAT-IRP *Occ A24*	Individual Research Project	Samuel Court	80		80	N	21/10/2024	04/12/2024	04/08/2025	50 50	THESIS IPRES	75 25				04/08/2025 11/08/2025	
13	I-DAT-IPPDA *Occ A24*	Individual Practical Project (Data Analytics Specialist)	Samuel Court	80		80	N	04/12/2024	04/12/2024	04/06/2025	50 50	ICW OR	75 25				30/07/2025 26/08/2025	As recommended following-Point Assessment
14	I-DAT-IPPBE *Occ A24*	Individual Practical Project (Digital Business and Enterprise Systems Architecture Specialist)	Samuel Court	80		80	N	04/12/2024	04/12/2024	04/06/2025	50 50	ICW OR	75 25				30/07/2025 26/08/2025	As recommended following End-Point Assessment

Please list all modules that are used by another existing course.

Module code	**Module title**	**Course that owns the module**	**Other course(s)/ programme(s) that use the module**

8. How are the ILOs assessed?

The course uses a range of formative and summative assessment types that are challenging and enable the students to develop and demonstrate a range of skills, including Individual Coursework (ICW), Group Coursework (GCW), Group Presentation (GPRES), Individual Presentation (IPRES), Reflective Portfolio (RP), thesis (THESIS), Viva Voce examination (OR).

This approach has been adopted because:

Individual Coursework (ICW) will be the common approach for the ILO assessment across the taught modules. Each of the modules will contribute 10 credits to the overall course. The ICW-based approach will offer the opportunity for each student to conduct independent work and to report their findings in a structured way through a variety of formats such as essay, report, proposal/bid and practical work. These will report on different aspects related to a digital technology and solution aligned to the module. The taught modules will introduce students to a range of digital technologies and will be assessed in various ways to develop a range of skills as outlined next: Module 1 will take a theoretical basis to digital engineering, in order to introduce the topic and its practical applicability. This will be assessed through a 2000-word 'essay' that outlines the principles of digital engineering with the intent to justify its use. Module 2 will focus on a practical design for a digital solution, and it will be assessed through a 2000-word 'proposal or bid' which focuses on the justification. Modules 3-7 and 9-10 are driven by the target to develop digital and technology solutions for specific needs. In each module a practical technology or solution will be developed. The assessment will be achieved through a 1000-word 'report' that explains the developed solution in terms of the problem its aiming to solve, and the detailed approach taken to solve it. In addition to the 'report' students will be expected to submit various justifications in the form of evidence of their work including but not limited to software demonstration, software code, simulation, video, and picture images submitted along with the 'report' as evidence. Module 8 will focus on the integration of the developed digital technologies and solutions across the previous modules. The module will also focus on testing and provided assurances to apply the developed integrated solution. This module will be assessed through 'Practical work' with a 1000-word write-up of the digital technology and solution integration procedure and outcomes from the tests applied to provide a sense of assurance. Along with the 1000-word write-up, the student will be expected to provide evidence of the work in a variety of formats such as software demonstration, videos, pictures. Further details on the assessment for the modules is provided in the Module Descriptors.

The group project is assessed with three different Summative elements including: Group project report at 8000 words, Oral presentation that lasts 30 minutes and 10 minutes for question and answer, and Reflective report at 1000 words. The Coursework involves addressing a real-life digital challenge that will be set in collaboration with the industrial sponsor.

The Individual Practical Project for those on the apprenticeship route is assessed by a written report at 10,000 words. They will also be assessed through a Professional Discussion, which will last 90 minutes (+/- 10%) of which 30 minutes should be focussed on the content of the portfolio. This discussion will be in-line with the EPA requirements considering the KSBs and reporting through the portfolio of evidence.

Those on the non-apprenticeship route will conduct an Individual Research Project, as opposed to the Individual Practical Project. Non-apprentices will be assessed by 1) a written report at 10,000 words and 2) an end-of-project presentation, involving the development of a poster that includes a project impact register, and it will last 10 minutes for the presentation and 5 minutes for questions and answers.

This collective approach has been adopted in order to provide the student with a balanced mix of theory, practical application to a problem and development of skills to present technical results in a written or oral forms. Most tasks are undertaken both on an individual level and through teamwork to prepare the students to work effectively independently as well as in a team.

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

(Module numbers should correspond with those used in the Course module table above.)

For Example:

Award ILOs / Module No.	***ILO 1.***	***ILO 2.***	***ILO 3.***	***ILO 4.***	***ILO 5.***	***ILO 6.***	***ILO 7.***	***ILO 8.***	
98	*ICW*				*EX*	*EX*	*ICW*		
99	*ICW1*		*ICW1*	*ICW2*					

A. Postgraduate Certificate

Award ILOs / Module No.	ILO 1	ILO 2	ILO 3
1	ICW	ICW	
2	ICW	ICW	
3		ICW	ICW
4		ICW	ICW
5			ICW
6			ICW
7			ICW
8	ICW		ICW
9			ICW
10			ICW

B. Postgraduate Diploma

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs / Module No.	ILO 4	ILO 5	ILO 6
1			ICW
2			ICW
3	ICW	ICW	
4	ICW	ICW	
5		ICW	
6		ICW	
7		ICW	ICW
8	ICW	ICW	ICW
9	ICW		
10		ICW	
11	GCW GPRES ICW	GCW GPRES ICW	GCW GPRES ICW

C. MSc

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs / Module No.	ILO 7	ILO 8	ILO 9
11	GCW GPRES ICW	GCW GPRES ICW	GCW GPRES ICW
12	THESIS IPRES	THESIS IPRES	THESIS IPRES
13	ICW OR		ICW OR
14	ICW OR		ICW OR

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	**Modules Covered**	**Assessment**	
		Type	Weight (%)

9. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who provides authoritative guidance on policy and procedure to the Panel. Proposals are reviewed in line with the UK Quality Code for Higher Education. New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guiding principles to meet the Expectations and Core Practices of the UK Quality Code for Higher Education. External examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the UK Quality Code for Higher Education. The delivery of new partnership provision is ultimately approved by the Universities Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

10. What opportunities are graduates likely to have on completing the course?

The Level 7 Digital and Technology Solutions Apprenticeship and MSc (non-apprenticeship route) will enable you to develop your knowledge, skills and behaviours while applying what you learn directly in your workplace. The programme will support your career progression, preparing you, if you so wish to, to successfully carry out senior leadership roles in the future.

The Course is unique as it will offer students the ability to see the bigger picture with digital engineering, and to design and develop bespoke solutions to meet the needs of value-adding activities. This will offer a significant advantage to students on the course in terms of differentiating themselves from other colleagues. Apart from developing your technical skills, the course will support you to:

Develop digital engineering skills to make operational and strategic improvements in enterprises and projects
Apply digital technologies and solutions to address challenges and introduce innovation
Discover and develop your leadership and team-working style
Develop and lead change and prepare the business to face future digital transformation.

Our Career services team offer individual career consultations, speaker events, alumni networking, networking workshop, personal and executive career coaching, leadership assessment centre, and more practical skills-based workshops on writing CVs and cover letters, and interview skills. Students on this course will be able to progress their careers in numerous areas such as project management, bidding, digital architects, digital twin development, and data analytics. The roles will be both strategic and operational in nature across sectors that rely on complex engineered assets.

COURSE SPECIFICATION

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

COURSE TITLE: MSc in Digital Forensics

Date of first publication/latest revision: June 2024

L. What is the course?

Course information

Course Title	Digital Forensics
Course code	**MSc, PgDip, PgCert Digital Forensics** (MSDFOFTC, PDDFOFTC, PCDFOFTC, MSDFOPTC, PDDFOPTC, PCDFOPTC) SPDFOPTC
Academic Year	2023/2024
Valid entry routes	MSc, PgDip, PgCert
Exit routes	PgDip, PgCert, MSc
Mode of delivery	Full-time, Part-time
Location(s)[1] of Study	Shrivenham
School(s)	Cranfield Defence and Security
Theme	Defence and Security
Centre	Cranfield Forensic Institute
Programme Director **Course Directors**	Graeme Horsman – Digital Forensics Course Director Andrew Sheldon – Digital Forensics Deputy Course Director
Awarding Body	Cranfield University
Is this an AP Contract course?[2]	No

[1] If any part of this course is delivered at another site, please note which one(s) here

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis ; MULTI – Multi-part assessment

Teaching Institution	Cranfield University
Admissions body	Cranfield University
Entry requirements	Standard University entry requirements
UK Qualifications Framework Level	QAA FHEQ level 7 (Masters)
Benchmark Statement(s)	N/A
Registration Period(s) available	Part-time: 2 years (PgDip and PgCert) or 3 years (MSc) Full-time: 1 year (PgDip and PgCert) or 13 months (MSc)
Course Start Month(s)	October

Institutions delivering the course

This course is delivered by Cranfield Forensic Institute within Cranfield Defence and Security, where the research interests include security technology, security studies, counter terrorism, forensic archaeology and anthropology, archaeological science, ballistics, explosives, digital forensics, information technology security and legal issues, forensic biomechanics and osteomics.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

No accreditation for this course currently

M. What are the aims of the course?

Cranfield University offers this course in order to:

- provide students with an understanding of how digital forensic science can be used to help resolve issues in relation to civil and criminal law
- help equip students with the necessary understanding of digital forensic science, courtroom skills and research methods in order to prepare them to practise as digital forensic professionals.

Postgraduate Diploma (PgDip) and Postgraduate Certificate (PgCert) exit routes are provided for students who wish to access only parts of the course provided.

[2] AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

This programme is intended for the following range of students:

- graduates with relevant first degrees e.g. BSc in Computer Science, Digital Forensics, Information Security, Forensic Science.
- other graduates working in relevant professional fields of study, including forensic science, information technology, forensic engineering and law
- practitioners in digital forensics, information technology or forensic science.

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate

In completing this course, and achieving the associated award, a diligent student should be able to:

ILO develop a critical awareness of current practice in digital forensic science.

ILO demonstrate critical assessment and originality of thought through the examination of a wide range of different types of digital evidence using a variety of digital forensic analysis techniques.

ILO critically assess data through the application of appropriate statistical tests and/or other reasoning techniques.

ILO 4. demonstrate a critical awareness of the importance of traceability of digital evidence.

ILO 5. communicate effectively through the written word and orally by means of and the presentation of digital evidence in court.

ILO 6. demonstrate a wide range of transferable skills through the regular use of literature searches, critical use of the Internet and the use of desktop publishing techniques to construct reports.

B. Postgraduate Diploma

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

ILO 7. acquire and assimilate knowledge from a wide range of adjacent disciplines in archaeology, anthropology, engineering, and the physical sciences and how they impact on digital forensic science.

ILO 8. understand and employ the scientific principles behind current digital forensic analytical techniques and procedures to critically evaluate new ones and solve problems encountered.

C. MSc

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

ILO 9. independently plan and execute a detailed research project in digital forensics and present results at meetings.

ILO 10. write a research thesis that includes:

- a critical evaluation of current research in a specific area of digital forensics
- construction and justification of a research methodology in that area
- clear explanation of experimental/analytical procedures and the presentation of results by appropriate means
- evaluation of the methods, experiments, and analysis with conclusions that place the research in the context of the professional practice of the digital forensic science.

4. How is the course taught?

Our education philosophy is led by the basic principles of:

- research led teaching – through a course team that are active researchers or practitioners
- hands-on experience – experience-based learning through students spending time undertaking realistic practical exercises
- access to comprehensively equipped digital forensic laboratory where students will be able to undertake digital forensic examinations and experimentation
- access to various digital forensic tools including the leading examination software
- access to external experts who are considered to be at the top of their field and are currently practising in digital forensics
- learning through multiple assessment methods - we view assessment as part of the learning process, with a variety of assessment methods extending the curriculum and transferable skills

The teaching and learning in the taught phase modules include the traditional lecture, incorporating the effective use of visual aids and supported by high quality written material where appropriate. However, it also makes extensive use of computer-based practical exercises, both guided and independent. There is also a substantial amount of independent study, both before the

taught phase of modules, and after, as summative assessment coursework. This independent study is important in most degrees but is particularly relevant in an extremely fast-moving field. We aim to teach students the fundamental principles, with up-to-date examples, but the students must learn early on to obtain specific knowledge for themselves through experimentation or traditional literature searches. Coursework assignments range from traditional essays, writing research papers, developing software, and conducting complex and realistic digital forensic analyses. Also, the 'Courtroom Skills' module provides a focus for the developments of presentation skills, but students are given guidance on reports and presentations at a very early stage in the course during Introductory Studies.

In addition to the teaching methods outlined, students will be supported in their learning and personal development by:

- Good staff-student relations. Staff are enthusiastic and helpful, and the students respond accordingly. The Course Director is available to address any immediate issues of concern that a student or students may have in connection with the course.

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 7. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. Postgraduate Certificate in Digital Forensics

The accumulation of 60 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Introductory Studies [#1]	0
Digital Forensics Techniques and Traces [#2]	30
Introduction to Digital Crime and Investigation [#3]	10
ELECTIVE MODULES:	
20 credits chosen from:	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis ; MULTI – Multi-part assessment

Internet Based Investigations [#4]	20
Programming for Digital Forensics [#5]	20
Mobile Device Forensics [#6]	20
TOTAL:	**60**

B. Postgraduate Diploma in Digital Forensics

The accumulation of 120 credits (or more) through the assessment of taught modules as detailed below:

Description	**Credits**
COMPULSORY MODULES:	
Introductory Studies [#1]	0
Digital Forensic Techniques and Traces [#2]	30
Introduction to Digital Crime and Investigation [#3]	10
Internet Based Investigations [#4]	20
Programming for Digital Forensics [#5]	20
Mobile Device Forensics [#6]	20
Investigation and Evidence Collection [#7]	10
Courtroom Skills [#8]	10
ELECTIVE MODULES:	
N/A	
TOTAL:	**120**

C. MSc in Digital Forensics

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	**Credits**

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis ; MULTI – Multi-part assessment

COMPULSORY MODULES:	
Introductory Studies [#1]	0
Digital Forensic Techniques and Traces [#2]	30
Introduction to Digital Crime and Investigation [#3]	10
Internet Based Investigations [#4]	20
Programming for Digital Forensics [#5]	20
Mobile Device Forensics [#6]	20
Investigation and Evidence Collection [#7]	10
Courtroom Skills [#8]	10
Thesis [#9]	80
ELECTIVE MODULES:	
N/A	
TOTAL:	**200**

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists, and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of ≥50%;
- An average mark of ≥50% across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout

the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee);[3] [4]

- **For Taught Assessments,** the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
  - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of ≥50% across the taught assessments);
  - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
  - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥40 credits, which are not part of the taught assessment average), the pass mark of ≥50% (where they exist);
- **For the thesis,** a mark of ≥50% in order to receive a pass (where it exists).

6. How is the course structured?

Full-time students register for the course in October and are expected to complete the MSc within 52 weeks, the PGDip in 33 weeks and the PGCert in 33 weeks. PGCert is maximum period which enables selection of Modules available.

Part-time students register for the course in April and are expected to complete the MSc within 3 years, the PgDip within 2 years and the PgCert within 2 years.

With the exception of *Digital Forensic Techniques and Traces* which has a two-week residential, most modules are taught over one week with appropriate time allocated subsequently to complete the coursework assignment(s). The coursework for Courtroom Skills is submitted before the module with a practical assessment completed during the residential week

Students would normally commence their individual research project only on successful completion of the taught component of the course.

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[3] For students who were registered before 1 August 2015, the requirement to obtain a minimum mark for a taught assessment will not apply for taught assessment taken before 31 August 2015 (unless the assessment was designated as a "key assessment" under the previous Assessment Rules).

[4] Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of <40% (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award (<50%).

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis ; MULTI – Multi-part assessment

7. Course Level Assessment Strategy[5]

The assessment strategy of the course includes several different types across the degree. Early in the course the students will produce a reflective portfolio that summarises their experience while performing all parts of an end-to-end digital investigation. This serves as a framework in which the subsequent technical work sits and provides high-level context for the other modules. The other digital forensic modules all contain practical elements during the week that make up the formative assessment where students undertake computer-based analysis of a variety of digital forensic artefacts, create forensic images of storage media, or write digital forensic software. Summative assessment used on those modules cover a broad range of skills expected from a digital forensic professional (writing a literature-based review paper, conducting several digital forensic investigations, and producing an expert report, conducting digital forensic experiments, and reporting the experimental results, writing, testing and documenting software for use in digital forensics). These pieces of assessment should prepare the students whether they embark on a digital forensic research career or become digital forensic practitioners and develop their ability to communicate in multiple styles of documents. The forensic experiment assignment is designed to also prepare them partly for the MSc Project. These pieces of assessment are substantial; this has been designed in this way to reflect the need for digital forensic graduates to be highly confident in their independent learning abilities as this is a very fast-moving field and new information needed for investigations emerges daily. These digital forensic specific assessments are complemented by the assessment on the Courtroom Skills module from the Forensic Programme, where students are required to present the results of one of their forensic examinations in a mock court, which is assessed orally, giving them further, highly relevant experience. Finally, the MSc Project requires a much more substantial research piece to be conducted that further develops their practical and critical thinking skills in the digital forensics area.

[5] Guidance to aid colleagues writing or updating a course-level assessment strategy for inclusion in the Course Specification can be found as Appendix K in either the Senate Handbook on Setting up a New Taught Course or the Senate Handbook on Managing Taught Courses
https://intranet.cranfield.ac.uk/EducationServices/Pages/SenateHandbooksA-Z.aspx

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis ; MULTI – Multi-part assessment

Course modules

The following modules outline all parts of the programme leading to an **MSc**. Other awards associated with the course include some or all of these modules.

Module Number	Module code	Title	Module Leader	Contact hours[6]	Lecturers[7]	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[8] - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	module[9] (%) of Independent	Weighting within module of multi-part assessments [10](100%)	Type of Assessment	elements of multi-part assessment[11]	Assessment Submission and/or exam date[12]	Assessment / Exam Retake date

[6] Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice
[7] Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

[8] A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.
[9] For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education.
[10] For **multi-part assessments** please record the overall weighting of module which should be 100%. Multipart assessments should only be included in courses where there is a clear andragogical reason and where each element forms part of a continuous learning and assessment experience for students.
[11] Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate*)*. If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.
[12] Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis ; MULTI – Multi-part assessment

1	R-FCO-IS	Introductory Studies	Andrew Sheldon	8	0	0	N	(FT/PT-A) 0 2-Oct 23	(FT/PT-A) 02-Oct-23	(FT/PT-A) 02-Oct-23	N/A	AO	N/A				N/A	N/A
2	R-FCO-FCF	Digital Forensic Techniques and Traces	Neil Parry	70	0	30	N	(FT/PT-A) 27-Nov-23	(FT/PT- A) 04-Dec-23	(FT/PT- A) 15-Dec-23	50	ICW 1 ICW 2	40 60				FT 09-Feb-24 (ICW 1&2) PT 23-Feb-24 (ICW 1&2)	TBC
3	R-FCO-FP	Introduction to Digital Crime and Investigation	Andrew Sheldon	35	0	10	N	(FT/PT- A) 30-Oct-23	(FT/PT- A) 06-Nov-23	(FT/PT-A) 10-Nov-23	50	RP	100				FT 01-Dec-23 PT 15-Dec-23	TBC
4	R-FCO-FI1	Internet Based Investigations	Andrew Sheldon	35	0	20	N	(FT/PT- A) 12-Feb-24	(FT/PT- A) 19-Feb-24	(FT/PT- A) 23-Feb-24	50	ICW	100				FT 01-Apr-24 PT 15-Apr-24	TBC

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis ; MULTI – Multi-part assessment

5	R-FCO-SPFC1	Programming for Digital Forensics	Alexander Caithness	35	0	20	N	(FT/PT- A) 15-Apr-24	(FT/PT- A) 22-Apr-24	(FT/PT- A) 26-Apr-24	50	ICW	100				FT 07-Jun-24 PT 21-Jun-24	TBC
6	R-FCO-MDF	Mobile Device Forensics	Richard Walker	35	0	20	N	(FT/PT- A) 11-Mar-24	(FT/PT- A) 18-Mar-24	(FT/PT- A) 22-Mar-24	50	ICW	100				FT 06-May-24 PT 06-May-24	TBC
7	R-FP-IEC	Investigation and Evidence Collection	Hannah Moore	30	0	10	Y	(FT/PT- A) 16-Oct-23	(FT/PT- A) 16-Oct-23	(FT/PT- A) 20-Oct-23	50	GPRES	100				FT/PT FT 20-Oct-23 PT 20-Oct-23	TBC

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis ; MULTI – Multi-part assessment

8	R-FP-CS	Courtroom Skills	Kate Hewins	25	0	10	Y	(FT/PT) 19/02/24	(FT/PT) 19/02/24-21/02/24 and 29/04/24-01/05/24	(FT/PT) 01/05/24	50 50	OR ICW	60 40				ALL 30-1st May 24 ALL 28th March 24	Next available date
9	R-FCO-THESIS	Thesis	Andrew Sheldon	16	0	80	N	(FT/PT-A22) 25-Mar-24	(FT/PT A22) 10-Jun-24	(FT/PT A22) 27-Sep-24	50 50	Thesis OR	70 30				FT/PT 30-Sep-24	N/A

Module Type for Forensic Award Themes **(C – Compulsory, E – Elective, RS – Role Specific *20 credits **pre-requisite)**

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis ; MULTI – Multi-part assessment

Module	MSc Theme	Digital Forensics		Marketed as short course	Joint with another MSc
1	R-FP-IS (Introductory Studies)	C		NO	
2	R-FCO-FCF (Digital Forensics Techniques and Traces)	C		YES	
3	R-FCO-FP (Introduction to Digital Crime and Investigation)	C		YES	
4	R-FCO-FI1 (Internet Based Investigations)	C		YES	
5	R-FCO-SPFC1 (Programming for Digital Forensics)	C		YES	
6	R-FCO-MDF (Mobile Device Forensics)	C		YES	
7	R-FP-IEC (Investigation and Evidence Collection)	C		YES	Forensic Programme
8	R-FP-CS (Courtroom Skills)	C		YES (short course for credit only)	Forensic Programme
9	R-FCO-THESIS Thesis	C		NO	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS - thesis ; MULTI – Multi-part assessment

Please list all modules that are used by another existing course.

Module code	**Module title**	**Course that owns the module**	**Other course(s)/ programme(s) that use the module**
R-FP-CS	Courtroom Skills	Forensic Programme	Counterterrorism Programme, Safety Accident and Investigation
R-FP-IEC	Investigation and Evidence Collection	Forensic Programme	Counterterrorism Programme

8. How are the ILOs assessed?

The assessment of candidates is based upon a variety of coursework assignments and, for masters course students, the research based dissertation:

- For the PgCert, a variety of assignments is designed to assess underlying principles and applications within the digital forensic environment and an ability to acquire and use information in that context. Students are expected to take on a professional role and assessments involve critical evaluation and professional judgement through a balance of report writing (including expert witness statements, and critical reviews)
- In the PgDip, students will go into more depth through the study of more modules. In addition, through the *Courtroom Skills* and *Investigation and Evidence Collection* modules they will gain an appreciation of the broader legal and forensic science context and have additional experience of oral examinations.

To complete the course to the award of a Masters level qualification, students must progress through PgCert and PgDip modules and assessment to the final element of the programme, the research based dissertation. Students must pass this final element of the programme with a minimum mark of 50%. The practical nature of the course requires that this should normally be based on an experimental investigation.

A variety of different types of coursework are used to assess different aspects of the student's knowledge and ability. Conventional essay work is used to test research skills and analytical ability and is often based on a critical review of the literature. A wide range of data types and sources are used. While journals, conference papers and specialist textbooks are most frequently used, students are expected to use other sources such as government publications, newspapers, television and internet sites when appropriate. Consequently, students have to demonstrate an awareness of the reliability of the source and the possibility of conflicting interests. Professional skills are developed through writing analytical reports on case studies and practical work, with a particular emphasis on clear but concise presentation. Students can expect assessed coursework to be returned to them no longer than 20 working days following the deadline for handing in, according to university regulations.

All digital forensics modules require a coursework assignment based either on an essay, a practical forensic examination, software development, or experimentation. The *Digital Forensic Techniques and Traces* module requires two such assignments.

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

(Module numbers should correspond with those used in the Course module table above.)

A. Postgraduate Certificate

Award ILOs / ***Module No.***	***ILO 1.***	***ILO 2.***	***ILO 3.***	***ILO 4.***	***ILO 5.***	***ILO 6.***
1. Introductory Studies						
2. Digital Forensics Techniques and Traces		ICW	ICW		ICW	
3. Introduction to Digital Crime and Investigation	RP	RP		RP		RP
4. Internet Based Investigations	ICW		ICW	ICW		ICW
5. Programming for Digital Forensics	ICW			ICW		ICW
6. Mobile Device Forensics		ICW	ICW		ICW	

B. Postgraduate Diploma

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs / ***Module No.***	***ILO1***	***ILO 2***	***ILO 3***	***ILO 4***	***ILO5***	***ILO 6***	***ILO 7***	***ILO8***
1. Introductory Studies								
2. Digital Forensics Techniques and Traces								
3. Introduction to Digital Crime and Investigation								
4. Internet Based Investigations	ICW		ICW			ICW		ICW

5. Programming for Digital Forensics	ICW			ICW		ICW		ICW
6. Mobile Device Forensics		ICW	ICW		ICW			
7. Investigation and Evidence Collection				GPRES		GPRES	GPRES	
8. Courtroom Skills					OR	ICW	OR ICW	

C. MSc

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs / ***Module No.***	***ILO 1.***	***ILO 3.***	***ILO 6.***	***ILO 8.***	***ILO 9.***	***ILO 10.***
9. Thesis	Thesis OR	Thesis OR	Thesis OR	Thesis OR	Thesis OR	Thesis OR

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	**Modules Covered**	**Assessment**	
		Type	Weight (%)

9. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who acts as advisor to the Panel. Proposals are reviewed in line with the Quality Assurance Agency for Higher Education (QAA) Quality Code, in particular Chapter B1 (Programme Design and Approval) and in the case of partnership arrangements in accordance with Chapter B10 (Managing Higher Education with Others). New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guidance provided by the QAA particularly in Chapter B7 (External Examining) which emphasises that external examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition, students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.

2. A Partnership Delivery Approval Panel then considers whether the proposal meets the expectations and indicators of sound practice of the QAA Quality Code Chapter B10: Managing Higher Education Provision with Others, with regards to the management and operation of the partnership and that the academic standards and the quality of the student experience are assured in line with the remaining chapters of the QAA Quality Code. The delivery of new partnership provision is ultimately approved by the University's Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

10. What opportunities are graduates likely to have on completing the course?

The programme offers a highly effective springboard into many career opportunities. These include employment routes to Government and non-Governmental bodies, police departments and independent digital forensic consultants. It is also a necessary introduction that leads into conducting research at PhD level in the subject. The Digital Forensics MSc could be an important stepping-stone to an academic career in Digital Forensics.

COURSE SPECIFICATION

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

Date of first publication/latest revision: June 2024

1. What is the course?

Course information

Course Title	MSc in Engineering and Management of Manufacturing Systems
Course code	MSEMMFTC, MSEMMPTC, PDEMMFTC, PDEMMPTC, PCEMMFTC, PCEMMPTC
Academic Year	2023/24
Valid entry routes	MSc, PgDip, PgCert
Additional exit routes	N/A
Mode of delivery	Full-time, Part-time
Location(s)[1] of Study	Cranfield University
School(s)	School of Aerospace, Transport and Manufacturing
Theme	Manufacturing
Centre	Sustainable Manufacturing Systems Centre
Course Director	Dr Mohamed Afy-Shararah
Awarding Body	Cranfield University
Is this an AP Contract course?[2]	No
Is this course offered as a Cranfield Mastership?	No
Apprenticeship Standard the course is mapped to	N/A
Is the Degree apprenticeship integrated or non-integrated?	N/A
Is the Mastership offered as an open and/or closed course?	N/A
Teaching Institution	Cranfield University
Admissions body	Cranfield University

[1] If any part of this course is delivered at another site, please note which one(s) here
[2] AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Entry requirements	Standard University entry requirements
UK Qualifications Framework Level	QAA FHEQ Level 7 (Masters)
Benchmark Statement(s)	Not Applicable
Registration Period(s) available	Full-time MSc - one year, Part-time MSc - up to three years, Full-time PgDip - one year, Part-time PgDip - two years, Full-time PgCert - one year, Part-time PgCert - two years
Course Start Month(s)	Full-time: September and March. Part-time: anytime throughout year

Institutions delivering the course

This course is delivered by The School of Aerospace, Transport and Manufacturing, Manufacturing Theme, Sustainable Manufacturing Systems Centre where the research interests include:

- Manufacturing Systems Engineering
- Product-Service Systems
- Supply Chain Management
- Simulation and Modelling
- Innovation Management

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This MSc course is accredited by the The Institution of Mechanical Engineers (IMechE) and The Royal Aeronautical Society (RAeS) until August 2026 and The Institution of Engineering and Technology (IET) until August 2025 on behalf of the Engineering Council as meeting the requirements for Further Learning for registration as a Chartered Engineer (CEng). Candidates must hold a CEng accredited BEng/BSc (Hons) undergraduate first degree to comply with full CEng registration requirements.

2. What are the aims of the course?

The aim of this course is to further develop suitably trained and qualified individuals by providing them with the knowledge and skills necessary to make an immediate contribution to a company's manufacturing performance and operations.

Cranfield University offers this course in order to:

- To prepare graduates for a role in manufacturing engineering with an understanding of business functions and strategies.
- To engage students in independent and critical evaluation of the use of operations management concepts, issues and tools to address manufacturing industry problems.
- To provide students with an appreciation of manufacturing technologies and concepts.
- To equip students in transferable skills such as analytical, management and interpersonal skills needed for the creative and effective application of knowledge to address operations management problems in industry.
- To develop general and personal management skills needed to implement and influence change.
- To enhance a student's career in the manufacturing and related sectors.

This programme is intended for the following range of students:

- Those wishing to work nationally or internationally with manufacturing companies that need to address manufacturing systems problems.
- Those wishing to work in manufacturing and operations management consultancy.

- Those wishing to work in the public/government sector on industry competitiveness and productivity issues.

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate

In completing this course, and achieving the associated award, a diligent student should be able to:

ILO 1. Develop and demonstrate a systematic understanding and critical awareness of a manufacturing enterprise functions including manufacturing systems, management accounting, human resource management, and strategy development.

ILO 2. Demonstrate a comprehensive understanding of techniques needed for credible manufacturing system design and improvement projects.

ILO 3. Show originality in application of in-depth knowledge of manufacturing operations development and critically evaluate the appropriate applications of methodologies.

ILO 4. Critically evaluate theories for the analysis and design tools and their application to (a) solve manufacturing problems in terms of technology and/or organisations and (b) increase the effectiveness of manufacturing systems.

ILO 5. Demonstrate transferable skills including, personal responsibility, complex decision making and independence for further learning.

ILO 6. Develop a sound theoretical approach to critically evaluate data and information, undertaking a critical appraisal of technical and/or commercial literature.

ILO 7. Demonstrate the ability to apply practical and rigorous approaches to identify projects, develop engineering solutions and evaluate their effectiveness.

ILO 8. Propose and bring about improvements to appropriate business standards.

B. Postgraduate Diploma

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

ILO 9. Deal with complex problems and communicate effectively the results of group project/ dissertation to specialist and non-specialist audiences, both orally and in writing.

ILO 10. Demonstrate ability to provide technical and commercial leadership through planning industrial/research projects (budgets, people, tasks) and contributing to teams delivering under time pressures individually and as a team member.

C. MSc

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

ILO 11. Demonstrate independent and original research on a subject relevant to manufacturing system development and management involving project planning, development of new skills, critical evaluation of results and discussion of findings using methodologies that show further knowledge and understanding in future work.

ILO 12. Engage in innovative developments to select appropriate technologies and methodologies to suit particular projects.

4. How is the course taught?

The MSc course has three components: taught modules (40%), group projects (20%), and an individual research project (40%). The taught modules are typically delivered in one-week block between October and February (for September intake) and March and July (for the March intake).

The teaching methods include lectures, case studies, group exercises, field visits, seminar and computer-based demonstrations and exercises. All students attend a week of introductory lectures

(given during the first week of the course). Within this induction week, students will be introduced to personal development planning and asked to reflect on their transferable skills and to take ownership of their personal development during the course. Induction is followed by 8 weeks of assessed modules.

All PgDip and MSc students undertake a Group Project. The Group projects are group-based activities typically undertaken for 12 weeks between February and April (August and October for March intake). The projects are designed to integrate knowledge, understanding and skills from the taught modules in a real-life situation. The Group Project will typically involve a team of students between 5 and 8, working to investigate a manufacturing opportunity or solve a manufacturing problem. Part-time Students are encouraged to take the Group Project component and only in exceptional circumstances, and with approval from the Group Project Co-ordinator, will be permitted to replace the Group Project with an individual dissertation. The topic is to be agreed between the University and the student.

All MSc students will undertake a research project (thesis project) under the supervision of a member of academic staff. For the individual research project, each student is allocated a supervisor. Guidance sessions are provided as to what is required from the thesis and oral presentation.

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 8. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. Postgraduate Certificate

The accumulation of 60 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Modules 2, 5 and 6 Introduction	30 0
ELECTIVE MODULES:	
Modules 3, 4, 7, 8 and 9 (Select 3)	30
TOTAL:	60

B. Postgraduate Diploma

The accumulation of 120 credits (or more) through the assessment of taught modules as detailed below:

FULL TIME STUDENTS

Description	Credits
COMPULSORY MODULES:	
Modules 2-9 Group Project (10a) Introduction	80 40 0

TOTAL:	120

PART TIME STUDENTS

Description	**Credits**
COMPULSORY MODULES:	
Modules 2-9 Introduction	80 0
ELECTIVE MODULES:	
Group Project (10a) or Dissertation (10b)	40
TOTAL:	120

C. MSc

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

FULL TIME STUDENTS

Description	**Credits**
COMPULSORY MODULES:	
Modules 2-9 Group Project (10a) Individual Research Project (11) Introduction	80 40 80 0
TOTAL:	200

PART TIME STUDENTS

Description	**Credits**
COMPULSORY MODULES:	
Modules 2-9 Individual Research Project (11) Introduction	80 80 0
ELECTIVE MODULES:	
Group Project (10a) or Dissertation (10b)	40
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of ≥50%;
- An average mark of ≥50% across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of

your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee); [3]

- **For Taught Assessments,** the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
  - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of ≥50% across the taught assessments);
  - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
  - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥40 credits, which are not part of the taught assessment average), the pass mark of ≥50% (where they exist);
- **For the thesis,** a mark of ≥50% in order to receive a pass (where it exists).

6. How is the course structured?

Full-time students register for the course in September or March and are expected to complete the course within 12 calendar months.

This course is also offered on a part-time basis. In such a situation, students typically complete the various components of the course over two or three years. Typical case is to complete four taught modules plus a Group Project/Dissertation in year 1 and the remainder of the modules plus the Thesis in year two and/or year 3.

7. Course Level Assessment Strategy[4]

The EMMS course entails 8 taught modules as well as a group project and an individual research project thesis which are all designed to equip the MSc students with a full set of relevant knowledge, helping them build confidence and competence in the domain of engineering and management of manufacturing systems. The assessment strategy for the course is pertinent to the nature of the Intended Learning Outcomes (ILOs) for each module and include 2 written closed book exams (Operations Management, Operations Analysis) and a blend of individual and group coursework assignments for 6 of the modules. The group project assessment entails a group report, a group presentation and individual written reflections, whilst the individual thesis project requires a written thesis report and a marked oral presentation.

Each taught module incorporates formative assessment and feedback opportunities throughout the week-long content delivery, which prioritises interactive engagement with the topic, through case studies, live presentations, group work and hands-on simulations on authentic and novel thematic scenarios. This is part of the deliberate design of the course aiming for a balanced and varied assessment provision that enables the students to actively engage with the specific content of the ILOs and explore the introduced concepts and methods hands-on in a safe learning environment where they can receive constructive feedback from the academic tutors and their peers. The summative assessment rubrics and relationship

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[3] Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of <40% (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award (<50%).

[4] Guidance to aid colleagues writing or updating a course-level assessment strategy for inclusion in the Course Specification can be found as Appendix K in either the Senate Handbook on Setting up a New Taught Course or the Senate Handbook on Managing Taught Courses https://intranet.cranfield.ac.uk/EducationServices/Pages/SenateHandbooksA-Z.aspx

to the ILOs are introduced and discussed during the start and end of each module delivery week and are followed up with assessment “clinics” (face to face and online) where students can question, clarify and demonstrate any of their queries with regards to the scope and mechanics of the summative assessment element of each module.

Clear timing expectations for marking and feedback are set early and communicated upfront to the students for each module and all relevant communications are stated in the electronic Learning Management System for ease of reference and avoidance of doubt.

Course modules

The following modules outline all parts of the programme leading to **MSc.** Other awards associated with the course include some or all of these modules.

September (Full-time + Part-time) Intake

Module Number	Module code	Title	Module Leader	Contact hours[5]	Total hours delivered by Visiting Lecturers [6]	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[7] - 40% or 50%	Type of Assessment	Weighting within module[8] (%) of Independent	Weighting within module of multi-part assessments [9](100%)	Type of Assessment	Weighting of individual elements of multi-part	Assessment Submission and/or exam date[11]	Assessment / Exam Retake date
1	I-MAT-INWK	Introduction	Dr Sue Impey	39		0	Y	27/09/23	27/09/23	06/10/23	N/A	AO	N/A				N/A	
2	I-MNU-A1034	Operations Management	Dr Mohamed Afy-Shararah	32		10	Y	09/10/23	09/10/23	13/10/23	50	EX	100				27/10/23	Manufacturing resit exams will be during week

[5] Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice
[6] Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)
[7] A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.
[8] For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education
[9] For **multi-part assessments** please record the overall weighting of module which should be 100%. Multipart assessments should only be included in courses where there is a clear andragogical reason and where each element forms part of a continuous learning and assessment experience for students.
[10] Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate*)*. If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.
[11] Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours[5]	Total hours delivered by Visiting Lecturers [6]	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[7] - 40% or 50%	Type of Assessment	Weighting within module[8] (%) of Independent	Weighting within module of multi-part assessments [9](100%)	Type of Assessment	Weighting of individual elements of multi-part	Assessment Submission and/or exam date[11]	Assessment / Exam Retake date
	Occ A																	commencing 20/05/24
3	I-MNU-A1031 Occ A	Enterprise Systems	Dr Ip-Shing Fan	32		10	Y	04/12/23	04/12/23	08/12/23	50	ICW	100				15/01/24	Re-assessment date to be set by agreement of the Module Leader as/when required
4	I-MNU-A1029 Occ A	Operations Analysis	Dr Jelena Milisavljevic-Syed	32	8	10	Y	30/10/23	30/10/23	03/11/23	50	EX	100				11/12/23	Manufacturing resit exams will be during week commencing 20/05/24
5	I-MNU-IECM Occ A	Managing Change in Manufacturing	Dr Lampros Litos	35		10	N	16/10/23	16/10/23	20/10/23	50	GCW	100				13/11/23	Re-assessment date to be set by agreement of Course Director and Module Leader as/when required.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours[5]	Total hours delivered by Visiting Lecturers [6]	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[7] - 40% or 50%	Type of Assessment	Weighting within module[8] (%) of Independent	Weighting within module of multi-part assessments [9](100%)	Type of Assessment	Weighting of individual elements of multi-part	Assessment Submission and/or exam date[11]	Assessment / Exam Retake date
6	I-MNU-A1027 Occ A	Manufacturing Systems Engineering	Dr Maryam Farsi	32		10	Y	06/11/23	13/11/23	17/11/23	50	GCW	100				11/12/23	Re-assessment date to be set by agreement of the Module Leader as/when required
7	I-MNU-A1048 Occ A	Internet of Things	Dr Sandeep Jagtap	35		10	Y	27/11/23	27/11/23	01/12/2023	50	ICW	100				08/01/24	Re-assessment date to be set by agreement of the Module Leader as/when required
8	I-MNU-A1038 Occ A	Supply Chain Management	Mr John Patsavellas	32		10	Y	08/01/24	08/01/24	12/01/24	50	GCW	100				05/02/24	Re-assessment date to be set by agreement of the Module Leader as/when required
9	I-MNU-A1019	Manufacturing Strategy	Dr Patrick McLaughlin	35		10	Y	15/01/24	22/01/24	26/01/24	50	ICW	100				19/02/24	Re-assessment date to be set by agreement of the Module

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours[5]	Total hours delivered by Visiting Lecturers [6]	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[7] - 40% or 50%	Type of Assessment	Weighting within module[8] (%) of Independent	Weighting within module of multi-part assessments [9](100%)	Type of Assessment	Weighting of individual elements of multi-part	Assessment Submission and/or exam date[11]	Assessment / Exam Retake date
	Occ A																	Leader as/when required
10a	I-MAT-GRP P	Group Project	Dr David Ayre	20		40	Y	05/02/24	05/02/24 Occ A FT	29/04/24FT	50 50 50	GPRES GCW ICW	20 60 20				26/04/24 29/04/24 29/04/24	
			Dr Lampros Litos						04/03/24 Occ B PT	23/08/24 PT	50 50 50	GPRES GCW ICW	20 60 20				16/08/24 23/08/24 23/08/24	
10b	I-MAT-DISS	Dissertation for Part Time Students	Dr Sue Impey/ Dr David Ayre	20		40	Y	05/02/24	05/02/24	23/08/24	50 50	ICW (1) ICW (2)	80 20				23/08/24 23/08/24	
11	I-MNU-THESIS	Individual Research Project	Dr Gustavo Castelluccio	20		80	Y	05/02/24	Occ A = PT 05/02/23	PT 23/08/24	50 50	THESIS IPRES	90 10				23/08/24 29/08/24	
								26/04/24	Occ B = FT 26/04/24	FT 23/08/24	5050	THESIS IPRES	90 10				23/08/24 29/08/24	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours[5]	Total hours delivered by Visiting Lecturers [6]	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[7] - 40% or 50%	Type of Assessment	Weighting within module[8] (%) of Independent	Weighting within module of multi-part assessments [9](100%)	Type of Assessment	Weighting of individual elements of multi-part	Assessment Submission and/or exam date[11]	Assessment / Exam Retake date
			Dr Gustavo Castellucci o															

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours[12]	Total hours delivered by Visiting Lecturers [13]	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark[14] - 40% or 50%	Type of Assessment	Weighting within module15 (%) of	Weighting within module of multi-part assessments	Type of Assessment	Weighting of individual elements of multi-part assessment[17]	Assessment Submission and/or exam date[18]	Assessment / Exam Retake date
1	I-MAT-INWK Occ B	Introduction	Dr Sue Impey	18		0	Y	02/03/23	02/03/23 Occ B	03/03/23	N/A	AO	N/A				N/A	
2	I-MNU-A1034 Occ B	Operations Management	Dr Mohamed Afy-Shararah	32		10	Y	06/03/23	06/03/23 Occ B	10/03/23	50	EX	100				15/05/23	Resit exams will be with 2023/24 cohort in December 2023
3	I-MNU-A1031 Occ B	Enterprise Systems	Dr Ip-Shing Fan	32		10	Y	20/03/23	20/03/23 Occ B	24/03/23	50	ICW	100				19/04/23	Re-assessment date to be set by agreement of Course Director and Module Leader

[12] Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice
[13] Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)
[14] A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%. This will be at the Board of Examiners discretion.
[15] For **independent assessments** please record type and weighting of each separate piece of assessment individually.
[16] For **multi-part assessments** please record the overall weighting of module which should be 100%.
[17] Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate*)*. If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.
[18] Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours[12]	Total hours delivered by Visiting Lecturers [13]	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark[14] - 40% or 50%	Type of Assessment	Weighting within module15 (%) of	Weighting within module of multi-part assessments	Type of Assessment	Weighting of individual elements of multi-part assessment[17]	Assessment Submission and/or exam date[18]	Assessment / Exam Retake date
																		as/when required.
4	I-MNU-A1029 Occ B	Operations Analysis	Dr Jelena Milisavljevic Syed	32	8	10	Y	10/04/23	10/04/23 Occ B	14/04/23	50	EX	100				19/05/23	Resit exams will be with 2023/24 cohort in December 2023
5	I-MNU-IECM Occ B	Managing Change in Manufacturing	Dr Lampros Litos	35		10	N	26/04/23	24/04/23 Occ B	28/04/23	50	GCW	100				22/05/23	Re-assessment date to be set by agreement of Course Director and Module Leader as/when required.
6	I-MNU-A1027 Occ B	Manufacturing Systems Engineering	Dr Maryam Farsi	32		10	Y	15/05/23	22/05/23	26/05/23	50	GCW	100				26/06/23	Re-assessment date to be set by agreement of Course Director and Module Leader

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours[12]	Total hours delivered by Visiting Lecturers [13]	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark[14] - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module15 (%) of	Weighting within module of multi-part assessments	Type of Assessment	Weighting of individual elements of multi-part assessment[17]	Assessment Submission and/or exam date[18]	Assessment / Exam Retake date
																		as/when required.
7	I-MNU-A1048 Occ B	Internet of Things	Dr Sandeep Jagtap	35		10	Y	05/06/23	05/06/23 Occ B	09/06/23	50	ICW	100				03/07/23	Re-assessment date to be set by agreement of Course Director and Module Leader as/when required.
8	I-MNU-A1038 Occ B	Supply Chain Management	Mr John Patsavellas	32		10	Y	08/05/23	08/05/23 Occ B	12/05/23	50	GCW	100				12/06/23	Re-assessment date to be set by agreement of Course Director and Module Leader as/when required.
9	I-MNU-A1019 Occ B	Manufacturing Strategy	Dr Patrick McLaughlin	35		10	Y	12/06/23	19/06/23	23/06/23	50	ICW	100				17/07/23	Re-assessment date to be

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours[12]	Total hours delivered by Visiting Lecturers [13]	Credits	Is the module shared? Y/N	Calendar			Assessment								
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark[14] - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module15 (%) of	Weighting within module of multi-part assessments	Type of Assessment	Weighting of individual elements of multi-part assessment[17]	Assessment Submission and/or exam date[18]	Assessment / Exam Retake date
																		set by agreement of Course Director and Module Leader as/when required.
10a	I-MAT-GRPP C23	Group Project	Dr Lampros Litos	20		40	Y	11/07/23	11/07/23 Occ C	27/10/23	50 50 50 50	GPRES GCW ICW IPRAC	16 64 10 10				20/10/23 27/10/23 27/10/23 27/10/23	
10b	I-MAT-DISS	Dissertation for Part Time Students						Not available for this intake									Not available for this intake	
11	I-MNU-THESIS C23	Individual Research Project	Dr Lampros Litos	20		80	Y	31/10/23	31/10/23 Occ C	29/02/24	50 50	THESIS IPRES	90 10				23/02/24 26/02/24	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Please list all modules that are used by another existing course.

Module code	**Module title**	**Course that owns the module**	**Other course(s)/ programme(s) that use the module**
I-MAT-INWK	Introduction	Advanced Materials	Aerospace Materials, Manufacturing Technology and Management, Aerospace Manufacturing, Global Product Development and Management, Management and Information Systems, Welding Engineering, Maintenance Engineering and Asset Management, Engineering and Management of Manufacturing Systems
I-MNU-A1034	Operations Management	Engineering and Management of Manufacturing Systems	Aerospace Manufacturing, Global Product Development and Management, Management and Information Systems, Manufacturing Technology and Management, Metal Additive Manufacturing
I-MNU-A1031	Enterprise Systems	Management and Information Systems	
I-MNU-A1029	Operations Analysis	Engineering and Management of Manufacturing Systems	Aerospace Manufacturing, Manufacturing Technology and Management
I-MNU-A1027	Manufacturing Systems Engineering	Engineering and Management of Manufacturing Systems	Aerospace Manufacturing,
I-MNU-A1038	Supply Chain Management	Engineering and Management of Manufacturing Systems	Aerospace Manufacturing, Global Product Development and Management, Management and Information Systems
I-MNU-A1019	Manufacturing Strategy	Engineering and Management of Manufacturing Systems	Aerospace Manufacturing
I-MNU-A1048	Internet of Things	Engineering and Management of Manufacturing Systems	Computational and Software Techniques in Engineering
I-MAT-GRPP	Group Project	Advanced Materials	Aerospace Materials, Manufacturing Technology & Management, Management and Information Systems, Global Product Development and Management, Welding Engineering, Metal Additive Manufacturing, Maintenance Engineering and Asset Management, Engineering and Management of Manufacturing Systems

I-MAT-DISS	Dissertation for Part Time Students	Advanced Materials	Aerospace Materials, Manufacturing Technology and Management, Aerospace Manufacturing, Global Product Development and Management, Management and Information Systems, Welding Engineering, Metal Additive Manufacturing, Aerospace Management,
I-MNU-THESIS	Individual Research Project	Aerospace Manufacturing	Management and Information Systems, Global Product Development and Management, Aerospace Materials, Manufacturing Technology & Management, Welding Engineering, Metal Additive Manufacturing, Maintenance Engineering and Asset Management, Advanced Materials

8. How are the ILOs assessed?

The following assessment types are utilised:

The course uses a range of assessment types. Students can expect to have four written examinations, four pieces of assessment by submitted work, one piece of group project work (including an assessment of personal contribution to group work), and one element assessed by a thesis and an oral presentation.

This approach has been adopted in order to perform formative and summative assessments of the students to demonstrate their ability in a range of contexts. Part time students will be assessed by dissertation in place of the group project.

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

(Module numbers should correspond with those used in the Course module table above.)

A. Postgraduate Certificate

Award ILOs / Module No.	ILO 1.	ILO 2.	ILO 3.	ILO 4.	ILO 5.	ILO 6.	ILO 7.	ILO.8
1	Non-assessed							
2	EX				EX			
3	ICW	ICW						
4		EX	EX	EX	EX		EX	EX
5	GCW				GCW			
6		GCW	GCW	GCW			GCW	GCW
7		ICW				ICW		
8	GCW				GCW	GCW		
9		ICW	ICW	ICW	ICW	ICW	ICW	ICW

B. Postgraduate Diploma

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs / Module No.	ILO 9.	ILO 10.
10a	GPRES GCW ICW	GPRES GCW ICW
10b	ICW(1) ICW(2)	ICW(1) ICW(2)

C. MSc

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs / Module No.	ILO 11.	ILO 12.
11	THESIS IPRES	THESIS IPRES

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	Modules Covered	Assessment	
		Type	Weight (%)

9. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who provides authoritative guidance on policy and procedure to the Panel. Proposals are reviewed in line with the UK Quality Code for Higher Education. New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guiding principles to meet the Expectations and Core Practices of the UK Quality Code for Higher Education. External examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the UK Quality Code for Higher Education. The delivery of new partnership provision is ultimately approved by the Universities Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

10. What opportunities are graduates likely to have on completing the course?

The intention of the course is to provide students with knowledge and understanding and associated transferrable skills to make a contribution to industry on graduation. Graduates will typically seek employment in manufacturing industry, consultancies or research institutions. Common starting roles are manufacturing engineer, industrial engineer, technical analyst, project manager and PhD researcher. With time (quicker for those with more background experience) graduates progress to senior positions with significant responsibility for people, budgets and projects.

COURSE SPECIFICATION

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

Date of first publication/latest revision: June 2024

1. What is the course?

Course information

Course Title	Engineering Competence
Course code	MSECPPAC, PDECPPAC
Academic Year	2023/2024
Valid entry routes	MSc, PgDip
Additional exit routes	PgCert
Mode of delivery	Part-time
Location(s)[1] of Study	Cranfield Campus (face-to-face delivery) Distance Learning (online delivery)
School(s)	School of Aerospace, Transport and Manufacturing
Theme	Manufacturing
Centre	Sustainable Manufacturing Systems Centre
Course Director	Dr Jelena Milisavljevic Syed
Awarding Body	Cranfield University
Is this an AP Contract course?[2]	No
Is this course offered as a Cranfield Mastership?	Yes
Apprenticeship Standard the course is mapped to	Post Graduate Engineer
Is the Degree apprenticeship integrated or non-integrated?	Non-degree Qualification Students are required to complete a PgDip to gain Gateway. IfATE only recognise a degree apprenticeship if it is a full Masters degree. Therefore, this standard is classified as non-degree qualification.
Is the Mastership offered as an open and/or closed course?	Closed
Teaching Institution	Cranfield University

[1] If any part of this course is delivered at another site, please note which one(s) here
[2] AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Admissions body	Cranfield University
Entry requirements	Standard University Entry Requirements
UK Qualifications Framework Level	QAA FHEQ Level 7 (Masters)
Benchmark Statement(s)	Since 2006, the engineering community has agreed that the academic standards expected of engineering graduates are the same as the learning outcomes for graduates of Engineering Council accredited degrees, as set out in the *Accreditation of Higher Education Programmes: UK Standard for Professional Engineering Competence*. For this reason a separate list of standards is not provided in this Benchmark Statement. Instead readers are referred to the *Accreditation of Higher Education Programmes: UK Standard for Professional Engineering Competence*.
Registration Period(s) available	3 years
Course Start Month(s)	October

Institutions delivering the course

This course is delivered by School of Aerospace, Transport and Manufacturing, Manufacturing Theme (SATM), the Sustainable Manufacturing Systems Centre and other collaborating centres where the research interests include:

- Operations Management
- Manufacturing Systems Engineering
- Product-Service Systems
- Supply Chain Management
- Simulation and Modelling

Cranfield University interacts with the following institutions and in the following ways:

The course is overseen by an Industrial Advisory Panel that formally meets twice a year.

Students undertake course related project components off campus. In recent years, projects have been undertaken within sponsoring organisations

Teaching may also be provided by external speakers, mostly leading industry practitioners, but may also include invited lecturers from other institutions and other Schools within Cranfield University.

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This MSc course is accredited by The Institution of Mechanical Engineers (IMechE) and the Royal Aeronautical Society (RAeS) until August 2026 and The Institution of Engineering and Technology (IET) until August 2025 on behalf of the Engineering Council as meeting the requirements for Further Learning for registration as a Chartered Engineer (CEng). Candidates must hold a CEng accredited BEng/BSc (Hons) undergraduate first degree to comply with full CEng registration requirements.

What are the aims of the course?

Cranfield University offers this course to meet in full the qualification element of the published Level 7 Apprenticeship Standard for a Post Graduate Engineer. This course aims to prepare and develop the future manufacturing engineers and managers/leaders to be able to develop solutions to engineering problems, using new or existing technologies, through innovation, creativity and change and may have

technical accountability for complex systems with their associated risks. Such individuals will work in an area that covers a wide range of generic engineering disciplines which could include for example: software, integrated systems, mechanical, electrical, electronic, electromechanical, fluid power components/systems.

The objectives of the course are to equip post graduate engineers with a set of core knowledge principles and skills.

Such core knowledge includes:

- the theoretical knowledge to solve problems in existing and emerging technologies, applying and developing analytical techniques
- understanding of business and commercial needs/constraints
- the knowledge and understanding of own competencies capabilities and limitations, the ability to work within these and highlight when work goes outside of these
- understanding of financial responsibilities and authorisation processes
- understanding of technical sign off responsibilities
- transferable skills such as analytical and interpersonal skills needed for the creative and effective application of knowledge to address aerospace manufacturing issues.

The skills that the students are expected to gain out of this course include:

- safe working practices, an understanding of technical governance and quality management
- compliance with legislation and codes, but be able to seek improvements
- practical competence to deliver innovative products and services
- technical responsibility for complex engineering systems
- accountability for project(s)/programme(s), finance and personnel management, management of trade-offs between technical and socio-economic factors
- the skill sets necessary to develop other technical staff

This programme is intended for the following range of students:

- Talented UK students with a high grade BSc level.
- Ambitious high quality students with an international background.
- Early-career professionals who want to boost their career.
- Experienced and academically able engineers wishing to achieve a formal qualification

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate

In completing this course, and achieving the associated award, a diligent student should be able to:

ILO 1. Develop and assess analytical techniques for recommending engineering solutions.
ILO 2. Critically analyse and validate business and commercial needs and constraints.
ILO 3. Debate the requirements for ethics and sustainability in the Engineering Industry.
ILO 4. Recommend continuous process improvement (internal process and external factors).
ILO 5. Exhibit practical competence to deliver innovative products and services.
ILO 6. Validate technical responsibility for complex engineering systems.
ILO 7. Explain, justify and defend accountability for project(s)/programmes.

B. Postgraduate Diploma

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

ILO 8. Develop a sound theoretical approach to critically evaluate financial responsibilities and authorisations processes.

ILO 9. Judge and debate the management of trade-offs between technical and socio-economic factors.

C. MSc

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

ILO 10. Integrate knowledge in independent and original research on a subject relevant to manufacturing system development and management involving project planning, development of new skills, critical evaluation of results and discussion of findings using methodologies that show further knowledge and understanding in future work.

ILO 11. Develop and select appropriate technologies and methodologies to suit particular projects.

4. How is the course taught?

Students will be supported in their learning and personal development by:

The teaching methods include lectures, case studies, group working, tutorial study interactive and computer-based demonstrations and exercises. The Course will be presented on-line. The taught modules are typically delivered in 32 hours across 4 or 5 days during a one-week period during the two years of study.

The engineer apprentices will be grouped to conduct their challenging but life changing group projects. The group project will be conducted at the employer's site with regular (every two weeks) voice/video meetings with their academic mentor as part of the assessment process.

All MSc students will undertake a research project (thesis project) under the supervision of Cranfield academic staff, there will also be regular (fortnightly) audio, video or face to face meetings with their academic supervisor.

Both Group projects and individual research projects are designed to integrate knowledge, understanding and skills from the taught modules in a real-life situation.

Used of library resources: The students will be further supported through the use of the on-line resource available to students/apprentices both whilst they are a student of Cranfield University and through their continuing lifelong learning as an Alumnus of Cranfield.

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 6. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. Postgraduate Certificate (Not applicable for Apprenticeship)

The accumulation of 60 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	

Induction	0
ELECTIVE MODULES:	
Any 6 modules from modules 2 - 9	10
TOTAL:	60

B. Postgraduate Diploma

The accumulation of 120 credits (or more) through the assessment of taught modules as detailed below:

Description	**Credits**
COMPULSORY MODULES:	
Induction Modules 2 – 9 Group project (10)	0 80 40
TOTAL:	120

C. MSc

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	**Credits**
COMPULSORY MODULES:	
Induction Modules 2-9 Group Project (10) Individual research project (11)	0 80 40 80
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of ≥50%;
- An average mark of ≥50% across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee); [3]

[3] Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of <40% (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award (<50%).

- **For Taught Assessments,** the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
  - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a re-sit award capped at 50% would be insufficient to achieve an overall average mark of ≥50% across the taught assessments);
  - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
  - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥40 credits, which are not part of the taught assessment average), the pass mark of ≥50% (where they exist);
- **For the thesis,** a mark of ≥50% in order to receive a pass (where it exists).

6. How is the course structured?

Part-time MSc students are expected to complete the course within three years. The MSc course has three components: 8 taught modules (80 credits), a group project (40 credits), and an individual research project (80 credits). The group project will usually be undertaken during the second year and lasts six months. The individual research project follows and lasts for a year.

Part-time Apprenticeship students taking Pg Diploma are expected to complete the course within 2 years. The MSc course has two components: 8 taught modules (80 credits), and a group project (40 credits). The group project will usually be undertaken during the second year and lasts six months.

7. Course Level Assessment Strategy[4]

The assessment tasks are focused on assessing the learning from the module whilst building evidence of the application of skills and behaviours in the students' own workplaces. Both formative and summative assessment is utilised in the taught modules.

The assessments are work based to align with the purpose of the course – to create employees who can implement operational excellence in a work environment. Taught module assessments are between 2500 and 5000 words depending on the nature and content of the assignment. The students have around six weeks to complete the assessment after module completion. Where relevant, formative feedback is provided during class discussion of both module related aspects and work-based instances relevant to the module content. Formative assessment is also provided as part of in-module activity that requires individual and group presentation of findings to the class.

The group project is a work based operations issue that requires the students to work in a team to deliver a group based report and presentation. The group project also has an individual component that self-gauges the skill development during the course of the project.

The individual project is aligned with the module ILOs but will also add an end-point-assessment component that evaluates the implementation of the project based findings in the students' own workplaces. This evaluation will then form the basis of the end-point project presentation.

[4] Guidance to aid colleagues writing or updating a course-level assessment strategy for inclusion in the Course Specification can be found as Appendix K in either the Senate Handbook on Setting up a New Taught Course or the Senate Handbook on Managing Taught Courses https://intranet.cranfield.ac.uk/EducationServices/Pages/SenateHandbooksA-Z.aspx

Assessments are focused on application of learning, within and following the module. They relate module ILOs and to students' own workplace issues that are used as a basis of analysis, evaluation and synthesis of potential solutions.

Course modules

The following modules outline all parts of the programme leading to PgDip. Other awards associated with the course include some or all of these modules.

Open Cohort, Online Delivery – October 2022 Intake

Module Number	Module code	Title	Module Leader	Contact hours[5]	Total hours delivered by Visiting [6]	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	' Module Delivery' Start Date	' Module Delivery' End Date	Minimum Mark[7] - 40% or 50%	Type of Assessment	Weighting within module8 (%) of Independent assessments	Weighting within module of multi-part assessments [9](100%)	Type of Assessment	Weighting of individual elements of multi-part assessment[10]	Assessment Submission and/or exam date[11]	Assessment / Exam Retake date
4	I-ECP-DDI-23-A23	Design Driven Innovation Processes (EC)	Dr Ahmed Al-Ashaab	32		10	N	19/02/24	26/02/24	01/03/24	50	GCW	100				10/04/24	As required, in agreement with Course director and Module lead.

[5] Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice
[6] Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)
[7] A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.
[8] For **independent assessments** please record type and weighting of each separate piece of assessment individually.
[9] For **multi-part assessments** please record the overall weighting of module which should be 100%.
[10] Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.
[11] Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Module Number	Module code	Title	Module Leader	Contact hours[5]	Total hours delivered by Visiting [illegible][6]	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	' Module Delivery' Start Date	' Module Delivery' End Date	Minimum Mark[7] - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module8 (%) of Independent assessments	Weighting within module of multi-part assessments [9](100%)	Type of Assessment	Weighting of individual elements of multi-part assessment[10]	Assessment Submission and/or exam date[11]	Assessment / Exam Retake date
5	I-ECP-BPA-23-A23	Business Process Analysis and Engineering (EC)	Dr Ip-Shing Fan	32		10	N	02/01/24	08/01/24	11/01/24	50	ICW	100				19/02/24	As required, in agreement with Course director and Module lead.
7	I-ECP-OM-23-A23	Operations Management (EC)	Dr Mohamed Afy-Shararah	32		10	N	30/10/23	06/11/23	09/11/23	50	ICW	100				02/01/24	As required, in agreement with Course director and Module lead.
9	I-ECP-MSE-23-A23	Manufacturing Systems Engineering (EC)	Dr Maryam Farsi	24		10	N	15/04/24	22/04/24	26/04/24	50	GCW	100				05/06/24	As required, in agreement with Course director and Module lead.

Open Cohort, Online Delivery – October 2023 Intake

Module Number	Module code	Title	Module Leader	Contact hours[12]	Total hours delivered by Visiting	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	' Module Delivery' Start Date	' Module Delivery' End Date	Minimum Mark[14] - 40% or 50%	Type of Assessment	Weighting within module15 (%) of Independent assessments	Weighting within module of multi-part assessments [16](100%)	Type of Assessment	Weighting of individual elements of multi-part assessment[17]	Assessment Submission and/or exam date[18]	Assessment / Exam Retake date
1	I-ECP-IND – 23-A23	Induction (EC)	Dr Jelena Milisavljevic Syed	8		0	N	01/11/23	01/11/23	01/11/23	N/A	AO	N/A					N/A
2	I-ECP-GM-23-A23	General Management (EC)	Dr Sandeep Jagtap	32		10	Y	06/05/24	13/05/2024	17/05/2024	50	ICW	100				01/07/24	As required, in agreement with Course director and Module lead.

[12] Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice
[13] Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)
[14] A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.
[15] For **independent assessments** please record type and weighting of each separate piece of assessment individually.
[16] For **multi-part assessments** please record the overall weighting of module which should be 100%.
[17] Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.
[18] Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Module Number	Module code	Title	Module Leader	Contact hours[12]	Total hours delivered by Visiting	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	' Module Delivery' Start Date	' Module Delivery' End Date	Minimum Mark[14] - 40% or 50%	Type of Assessment	Weighting within module15 (%) of Independent assessments	Weighting within module of multi-part assessments [16](100%)	Type of Assessment	Weighting of individual elements of multi-part assessment[17]	Assessment Submission and/or exam date[18]	Assessment / Exam Retake date
3	I-ECP-PPM-23-A23	Project and Programme Management (EC)	Dr Ip-Shing Fan	32		10	N	04/12/2023	11/12/2023	14/12/2023	50	ICW	100				23/01/2024	As required, in agreement with Course director and Module lead.
4	I-ECP-DDI-24-A24	Design Driven Innovation Processes (EC)	Dr Ahmed Al-Ashaab	32		10	N	17/02/25	24/02/25	27/02/25	50	GCW	100				14/04/25	As required, in agreement with Course director and Module lead.
5	I-ECP-BPA-24-A24	Business Process Analysis and Engineering (EC)	Dr Ip-Shing Fan	32		10	N	26/12/2024	06/01/2025	09/01/25	50	ICW	100				17/02/25	As required, in agreement with Course director and Module lead.

Module Number	Module code	Title	Module Leader	Contact hours[12]	Total hours delivered by Visiting	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	' Module Delivery' Start Date	' Module Delivery' End Date	Minimum Mark[14] - 40% or 50%	Type of Assessment	Weighting within module15 (%) of Independent assessments	Weighting within module of multi-part assessments [16](100%)	Type of Assessment	Weighting of individual elements of multi-part assessment[17]	Assessment Submission and/or exam date[18]	Assessment / Exam Retake date
6	I-ECP-PD-23-A23	Lean Product Development (EC)	Dr Ahmed Al-Ashaab	32		10	Y	22/01/24	29/01/24	01/02/24	50	GCW	100				18/03/24	As required, in agreement with Course director and Module lead.
7	I-ECP-OM-24-A24	Operations Management (EC)	Dr Mohamed Afy-Shararah	32		10	N	28/10/24	04/11/24	07/11/24	50	ICW	100				07/01/25	As required, in agreement with Course director and Module lead.
8	I-ECP-CE-23-A23	Optimising Whole Life Cost and Performance Management (EC)	Dr Maryam Farsi	24		10	N	11/03/24	18/03/24	21/03/24	50	ICW	100				07/05/24	As required, in agreement with Course director and Module lead.

Module Number	Module code	Title	Module Leader	Contact hours[12]	Total hours delivered by Visiting	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	' Module Delivery' Start Date	' Module Delivery' End Date	Minimum Mark[14] - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module15 (%) of Independent assessments	Weighting within module of multi-part assessments [16](100%)	Type of Assessment	Weighting of individual elements of multi-part assessment[17]	Assessment Submission and/or exam date[18]	Assessment / Exam Retake date
9	I-ECP-MSE-24-A24	Manufacturing Systems Engineering (EC)	Dr Maryam Farsi	24		10	N	14/04/25	22/04/25	25/04/25	50	GCW	100				09/06/25	As required, in agreement with Course director and Module lead.
10	I-ECP-GRPP-23-A23	Group Project (EC)	Dr Jelena Milisavljevic Syed	20		40	N	01/04/24	01/04/24	30/09//24	50 50 50	GCW GPRES ICW	64 16 20				23/09/24 26/09/24 30/09/24	

Thesis Occurrences – To be used by returning students completing the MSc

Module Number	Module code	Title	Module Leader	Contact hours[19]	Total hours delivered by Visiting	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	' Module Delivery' Start Date	' Module Delivery' End Date	Minimum Mark[21] - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module22 (%) of Independent	Weighting within module of multi-part assessments [23](100%)	Type of Assessment	Weighting of individual elements of multi-part assessment[24]	Assessment Submission and/or exam date[25]	Assessment / Exam Retake date
11	I-ECP-THESIS – 22-A23	Individual Research Project (EC)	Dr Jelena Milisavljevic Syed	20		80	N	25/09/23	25/09/23	25/09/24	50 50	THESIS IPRES	90 10				25/09/24 18/09/24	
11	I-ECP-THESIS – 22-B23	Individual Research Project (EC)	Dr Jelena Milisavljevic Syed	20		80	N	08/01/24	08/01/24	14/12/24	50 50	THESIS IPRES	90 10				15/01/25 08/01/25	
11	I-ECP-THESIS – 22-C23	Individual Research Project (EC)	Dr Jelena Milisavljevic Syed	20		80	N	11/03/24	11/03/24	12/03/25	50 50	THESIS IPRES	90 10				12/03/25 05/03/25	

[19] Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice
[20] Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)
[21] A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.
[22] For **independent assessments** please record type and weighting of each separate piece of assessment individually.
[23] For **multi-part assessments** please record the overall weighting of module which should be 100%.
[24] Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate). If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.
[25] Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Module Number	Module code	Title	Module Leader	Contact hours[19]	Total hours delivered by Visiting	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	' Module Delivery' Start Date	' Module Delivery' End Date	Minimum Mark[21] - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module22 (%) of Independent	Weighting within module of multi-part assessments [23](100%)	Type of Assessment	Weighting of individual elements of multi-part assessment[24]	Assessment Submission and/or exam date[25]	Assessment / Exam Retake date
1 1	I-ECP-THESIS – 22-D23	Individual Research Project (EC)	Dr Jelena Milisavljevic Syed	20		80	N	19/06/24	19/06/24	18/06/25	50 50	THESIS IPRES	90 10				18/06/25 11/06/25	

Please list all modules that are used by another existing course.

Module code	Module title	Course that owns the module	Other course(s)/ programme(s) that use the module
I-ECP-GM	General Management	Engineering Competence	Manufacturing Technology and Management (Apprenticeship)
I-ECP-PD	Lean Product Development	Engineering Competence	Manufacturing Technology and Management (Apprenticeship)

8. How are the ILOs assessed?

The following assessment types are utilised:

All modules are assessed through the submission of written assignments (either individual or group ones).

The group project is assessed through a group report, group presentation and individual report (including an assessment of personal contribution to group work).

The individual research project will be assessed by a thesis and an individual presentation.

This approach has been adopted because:

This approach has been adopted in order to perform formative and summative assessments of the students to demonstrate their ability in a range of contexts.

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

A. Postgraduate Certificate

Award ILOs / Module No.	ILO 1.	ILO 2.	ILO 3.	ILO 4.	ILO 5.	ILO 6.	ILO 7.
2		ICW	ICW			ICW	ICW
3					ICW	ICW	ICW
4	GCW			GCW	GCW	GCW	GCW
5	ICW			ICW			ICW
6	GCW		GCW	GCW	GCW		GCW
7	ICW	ICW	ICW	ICW		ICW	
8		ICW	ICW	ICW			ICW
9	GCW					GCW	

B. Postgraduate Diploma

Award ILOs / Module No.	ILO 1.	ILO 2.	ILO 3.	ILO 4.	ILO 5.	ILO 6.	ILO 7.	ILO 8.	ILO 9.
2		ICW	ICW			ICW	ICW	ICW	
3					ICW	ICW	ICW		
4	GCW			GCW	GCW	GCW	GCW		
5	ICW			ICW			ICW		
6	GCW		GCW	GCW	GCW		GCW		GCW
7	ICW	ICW	ICW	ICW		ICW			ICW
8		ICW	ICW	ICW			ICW	ICW	
9	GCW					GCW			
10	GPRES GCW ICW	GPRES GCW ICW	GPRES GCW ICW	GPRES GCW ICW	GPRES GCW ICW	GPRES GCW ICW	GPRES GCW ICW	GPRES GCW ICW	GPRES GCW ICW

C. MSc

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs / Module No.	ILO 10	ILO 11
11	THESIS IPRES	THESIS IPRES

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	Modules Covered	Assessment	
		Type	Weight (%)

9. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who provides authoritative guidance on policy and procedure to the Panel. Proposals are reviewed in line with the UK Quality Code for Higher Education. New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6-year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guiding principles to meet the Expectations and Core Practices of the UK Quality Code for Higher Education. External examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition, students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the UK Quality Code for Higher Education. The delivery of new partnership provision is ultimately approved by the Universities Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

10. What opportunities are graduates likely to have on completing the course?

The students that will be enrolled in the present course will be already employed by engineering employers. The intention of the course is to provide students with knowledge and understanding and associated transferrable skills to make a contribution to the industry they are coming from on graduation.

COURSE SPECIFICATION

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

Date of first publication/latest revision: 05/02/2021/June 2024

1. What is the course?

Course information

Course Title	MSc in Engineering Management
Course code	MSC – MSEMJFTC PgDip (exit route only) – PDEMJFTC PgCert (exit route only) - PCEMJFTC
Academic Year	2023/24
Valid entry routes	MSc
Additional exit routes	PgDip, PgCert
Mode of delivery	Full Time
Location(s)[1] of Study	Jiangsu University Cranfield Tech Futures Graduate Institute, China. (with an optional 6 month 'excursion' at Cranfield)
School(s)	Jiangsu University Cranfield Tech Futures Graduate Institute affiliated with the School of Water, Energy and Environment
Theme	Energy and Power
Centre	Energy and Power
Course Director	Dr Jerry Luo
Awarding Body	Cranfield University
Is this an AP Contract course?[2]	No
Is this course offered as a Cranfield Mastership?	No
Apprenticeship Standard the course is mapped to	N/A
Is the Degree apprenticeship integrated or non-integrated?	N/A
Is the Mastership offered as an open and/or closed course?	N/A

[1] If any part of this course is delivered at another site, please note which one(s) here
[2] AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Teaching Institution	Jiangsu University Cranfield Tech Futures Graduate Institute
Admissions body	Cranfield University and Jiangsu University
Entry requirements	Standard University entry requirements.
UK Qualifications Framework Level	QAA FHEQ Level 7
Benchmark Statement(s)	N/A
Registration Period(s) available	2 years Full-time MSc
Course Start Month(s)	September

Institutions delivering the course

This course is delivered by Jiangsu University (JSU) Cranfield Tech Futures Graduate Institute" which is a formal collaboration between Cranfield and Jiangsu Universities. It has a formal semi-autonomous status as a Chinese-centred Institute that benefits from Cranfield academic input. It has been heavily sponsored by the Jiangsu Provincial Department of Education (the regional education body) and has the formal approval from the Ministry of Education in China.

Research Interests include:
Energy technologies and management
Power technologies and management
Mechanical engineering
Chemical engineering
Process systems engineering
Engineering Strategy and planning
Social and policy studies related to energy
Digital systems engineering
Cranfield University interacts with the following institutions and in the following ways:

- Jiangsu University as part of the Jiangsu University (JSU) Cranfield Tech Futures Graduate Institute

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This course is not accredited by any external bodies.

2. What are the aims of the course?

This program aims to train applied international engineering and technology management techniques to future engineering and technical managers. Students will learn key skills needed for the green economy to enable them to become managers of technology transitions, including future product developments, with a specific focus on sustainable technologies.

The student will develop a solid appreciation of the theory and broad professional knowledge in the field of engineering management, and master advanced methods of engineering system analysis, project planning and risk evaluation. They will develop the ability to independently undertake and lead successful new product development projects by developing knowledge and skills in project / product management. Students will develop a good understanding of the importance of professional ethics, sustainability and health and safety.

Specifically, the Master of Engineering Management program is targeted toward Chinese students, with the following three targeted ambitions:

1. Serving in the government departments: engaged in the strategic foresight design, engineering project system analysis and project planning & control.
2. Serving in specific engineering projects: engaged in international project planning, organization and control, techno-economic modelling and analysis of engineering project according to the characteristics of the project.
3. Serving in manufacturing enterprises: engaged in new product development management, enterprise project planning, organization and control.

This programme is intended for the following range of students:

1. Graduates and practicing engineers who wish to enhance their knowledge of various engineering management fields with a view to managing key engineering projects.
2. Graduates currently in employment who wish to extend their technical qualifications or up-skill their qualifications.
3. Graduates with management or science degrees or from other branches of engineering who wish to pursue a career change and require a conversion course.
4. Candidates with other educational qualifications but who possess considerable relevant experience

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate in Engineering Management

In completing this course, and achieving the associated award, a diligent student should be able to:

ILO 1. Develop appropriate plans to control and deliver engineering projects, while evaluating and managing project, economic, environmental and health and safety risks.

ILO 2. Formulate and manage the development of new product and platform strategies using horizon scanning and forecasting techniques

ILO 3. Evaluate the techniques for technology and strategy appraisal, including tools for stakeholder engagement and sustainability assessment

ILO 4. Assess and interpret methodologies and techniques required for the ethical planning and execution of engineering projects, including minimisation of risks

B. Postgraduate Diploma in Engineering Management

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

ILO 5. Integrate knowledge, understanding and skills from the taught modules into a real-life situation to address problems faced by engineers. This will require a detailed review of the literature related to this problem, with the student providing insight and communicating the findings in a professional manner in written, oral, or visual forms as required.

C. MSc in Engineering Management

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

ILO 6. Define a research question, develop aim(s) and objectives, select and execute a methodology, analyse data, evaluate findings critically and draw justifiable conclusions, demonstrating self-reflection and originality of thought.

ILO 7. Communicate their individual research via an academic paper (thesis), thus demonstrating a presentation style suitable for academic and professional audiences.

4. How is the course taught?

Students will be supported in their learning and personal development by:

Engaging with the wider learning environment at Cranfield and Jiangsu through attendance of seminars, lectures, workshops and other learning activities. The students will have access to the e learning support through the VLE.

The taught programme is generally delivered from September and is divided into 9 modules (5 delivered by Cranfield and 4 by Jiangsu). Each module is generally delivered over five days.

The dissertation/literature review and thesis/paper components are supported through student supervision meetings.

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 6. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. Postgraduate Certificate

The accumulation of 60 credits through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Induction Week	AO
ELECTIVE MODULES:	
Any 6 modules (60 credits) from: Operations Research (JSU delivery) Applied Economic Appraisal (CU delivery) Health, Safety, Sustainability and the Environment (CU delivery) Product Development and Strategy (CU delivery) Strategic Foresight (CU delivery) Strategic Management of Technical Functions (CU delivery) Engineering Ethics (JSU delivery) Project Planning and Control (JSU delivery)	 10 10 10 10 10 10 10 10
TOTAL:	60

B. Postgraduate Diploma

The accumulation of 120 credits through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Induction week Operations Research (JSU delivery) Applied Economic Appraisal (CU delivery) Health, Safety, Sustainability and the Environment (CU delivery) Product Development and Strategy (CU delivery) Strategic Foresight (CU delivery) Strategic Management of Technical Functions (CU delivery)	AO 10 10 10 10 10 10

Engineering Ethics (JSU delivery) Dissertation (Critical Literature Review)	10 40
ELECTIVE MODULES:	
Select 1 module from: Project Planning and Control (JSU delivery)	10
TOTAL:	120

C. MSc

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	**Credits**
COMPULSORY MODULES:	
Induction week Operations Research (JSU delivery) Applied Economic Appraisal (CU delivery) Health, Safety, Sustainability and the Environment (CU delivery) Product Development and Strategy (CU delivery) Strategic Foresight (CU delivery) Strategic Management of Technical Functions (CU delivery) Engineering Ethics (JSU delivery) Dissertation (Critical Literature Review) Thesis (Academic Paper)	AO 10 10 10 10 10 10 10 40 80
ELECTIVE MODULES:	
Select 1 module from: Project Planning and Control (JSU delivery)	10
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of ≥50%;
- An average mark of ≥50% across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee); [3]

[3] Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of <40% (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award (<50%).

- **For Taught Assessments,** the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
  - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of ≥50% across the taught assessments);
  - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
  - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥40 credits, which are not part of the taught assessment average), the pass mark of ≥50% (where they exist);
- **For the thesis,** a mark of ≥50% in order to receive a pass (where it exists).

6. How is the course structured?

Part-time students register for the course in September and are expected to complete the course within 2 years.

The students will be registered part-time for the course, starting in September and are expected to complete this section of the course within 24 calendar months.

Taught part 1: Modules
Each Cranfield module is delivered over one or two weeks, using a combination of teaching activities and a blended learning approach. The Jiangsu Institute modules are delivered across the entire semester. Taught modules are delivered at Jiangsu Institute. Modules are given throughout the second semester of Year 1. The exam will be held at determined point of the academic calendar. Students will undertake these modules in the first academic year.

Taught part 2: Literature Review / Dissertation
The literature review/dissertation consists of a total of 10 contact hours with a member(s) of the teaching staff and 390 hours of private study. Students will be assigned two supervisors by the Course Director and will agree with these supervisors an appropriate topic of study. This may be related to a future workplace/industrial area of interest that is relevant to the student's career plan. This aspect will include a comprehensive literature review of classical and contemporary related material and also a discussion and properly argued conclusions. Where appropriate the review/dissertation will acknowledge the work and contribution of others. This module will be assessed by a formal report.

Taught Part 3: Thesis/Paper
Students will produce a thesis / paper. This consists of a total of 20 contact hours with a member(s) of the teaching staff and 780 hours of private study. Thesis supervisors will be allocated to the students by the Course Director and the two will confirm a suitable topic for study. Within this time, they will produce an academic paper in a journal style relevant to their area of interest (decided in consultation with their supervisor). All students are required and must maintain regular contact (meetings, telephone conversations or e-mail correspondence) with their personal supervisor to discuss progress

Postgraduate Diploma (PgDip) and Postgraduate Certificate (PgCert) exit routes are provided for students who wish to access only parts of the course provided.

7. Course Level Assessment Strategy[4]

[4] Guidance to aid colleagues writing or updating a course-level assessment strategy for inclusion in the Course Specification can be found as Appendix K in either the Senate Handbook on Setting up a New Taught Course or the Senate Handbook on Managing Taught Courses https://intranet.cranfield.ac.uk/EducationServices/Pages/SenateHandbooksA-Z.aspx

Taught Modules:
The taught modules are primarily assessed through individual coursework or exam, allowing students to gain experience of written communication in a number of styles. This is supported by formative group work discussions and presentations that develop oral communication and group working skills. The individual coursework reports will help students in their future employment and professional practice in disseminating information, while the exam are intended to evaluate students' handling of applying a novel situation to an existing framework for solution.

Dissertation (Critical Literature Review):
The Literature Review/Dissertation provides the students with the opportunity to research, in depth, an area of engineering interest to them. It is expected that the review/dissertation will normally consist of the following elements: Abstract, Background context, Introduction to the theme(s) addressed within the dissertation and setting out the issues that will be covered, Methodology, In depth analysis/discussion of the topics discussed, Concluding remarks, References, Appendices (if relevant). Two supervisors are allocated to the dissertation and supervision follows the model used for the independent research project. The student will submit an 8,000 word report and will give an oral presentation of their work. Both elements of assessment will be marked by independent assessors.

Thesis (Academic Paper):
The thesis project requires students to further develop a problem definition, set a hypothesis, select and execute a methodology, analyse data, and evaluate findings and draw appropriate conclusions in the context of research questions relevant to the courses following this module. The student is then required to communicate their findings successfully via a thesis, written in the style of a scientific paper (12,000 words), and an oral presentation. The projects are designed to integrate knowledge, the taught modules, and apply understanding and skills from the dissertation, to deliver a high-quality written thesis and oral presentation.

Course modules

The following modules outline all parts of the programme leading to an MSc in Mechanical Engineering. Other awards associated with the course include some or all of these modules.

Module Number	Module code	Title	Module Leader	Contact hours[5]	Total hours delivered by Visiting	Credits	Is the module shared? Y/N	Calendar			Assessment				
								Module Start Date (eg Pre-	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[7] -	Assessment		Submission dates	
												Type of Assessment	Weighting within	Assessment Submission and/or	Assessment / Exam
1	J-JSU-INDWK	Induction Week Part 1 Part 2	Adriana Encinas-Oropesa	24		0	Y		04/09/2023 26/02/2024	08/09/2023 01/03/2024	N/A	AO	N/A	N/A	N/A
2	J-EGM-OR	Operations Research	Sun Dong Ying	24		10	N		09/10/23	30/10/23	40	EX	100	07/01/24	
3	J-EGM-PPC	Project Planning and Control	Hu Mingcai	24		10	N		06/11/23	17/11/23	40	ICW	100	29/12/23	
4	J-EGM-EE Occ B23	Engineering Ethics	Ding Hua	32		10	Y		20/11/23	15/12/23	40	ICW	100	05/01/24	
5	J-EGM-PDS	Product Development and Strategy	Matt Collins	36		10	N		04/03/24	08/03/24	40	ICW	100	16/03/24	
6	J-EGM-SMTF	Strategic Management of Technical Functions	Phil Longhurst	36		10	N		18/03/24	22/03/24	40	ICW	100	13/04/24	
7	N-OFF-HSSE Occ B23	Health, Safety, Sustainability and Environment	Liyun Lao	25		10	Y		22/04/24	26/04/24	40	ICW	100	11/05/24	

[5] Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice
[6] Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)
[7] A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.
[8] For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education.
[9] Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Module Number	Module code	Title	Module Leader	Contact hours[5]	Total hours delivered by Visiting	Credits	Is the module shared? Y/N	Calendar			Assessment				
								Module Start Date (eg Pre-	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[7] -	Assessment		Submission dates	
												Type of Assessment	Weighting within	Assessment Submission and/or	Assessment / Exam
8	I-EMB-A1005 Occ D23	Strategic Foresight	Kenisha Garnett	30		10	Y		13/05/24	17/05/24	40	ICW	100	25/05/24	
9	J-EGM-AEA	Applied Economic Appraisal	Jerry Luo	36		10	N		27/05/24	31/05/24	40	ICW	100	08/06/24	
10	J-JSU-DISS	Dissertation (Critical Literature Review)	Adriana Encinas-Oropesa	10		40	Y		02/09/24	29/11/24	50	IPROJ IPRES	80 20	29/11/24	
11	J-JSU-THESIS	Thesis (Academic Paper)	Adriana Encinas-Oropesa	20		80	Y		02/12/24	13/06/25	50	THESIS OR	90 10	13/06/25	

Please list all modules that are used by another existing course.

Module code	**Module title**	**Course that owns the module**	**Other course(s)/ programme(s) that use the module**
J-JSU-INDWK	Induction Week	Agricultural Engineering	Mechanical Engineering Environmental Engineering Engineering Management Energy Systems and Thermal Processes Environmental Engineering and Environmental Management Materials and Corrosion for Energy Systems
I-EMB-A1005	Strategic Foresight	Environmental Management for Business	Future Food Sustainability Engineering Management MSc in Sustainability
J-EGM-EE	Engineering Ethics	Engineering Management	Environmental Engineering (Jiangsu) Mechanical Engineering
N-OFF-HSSE	Health, Safety Sustainability & Environment	Renewable Energy	Engineering Management
J-JSU-DISS	Dissertation	Agricultural Engineering	Environmental Engineering (Jiangsu) Mechanical Engineering
J-JSU-THESIS	Thesis	Agricultural Engineering	Environmental Engineering (Jiangsu) Mechanical Engineering

8. How are the ILOs assessed?

The following assessment types are utilised:

The course uses a range of assessment types. Students can expect to have one written examination, eight pieces of assessment by submitted work, two large reports and two elements of assessment by presentation or viva. This approach has been adopted in order to provide a balance between formal examination and a less rigid written/verbal communication.

This approach has been adopted because:

Assessment by Exams:
The underlying assessment strategy across all modules will be to examine the understanding of engineering management principles and applications. This will be achieved by testing the ability to solve realistic multi-disciplinary problems within a Engineering Management context. Proper application and appreciation of mechanical engineering models and methodologies will be paramount to the successful completion of the course.

Assessment by Coursework:
Coursework will be set to reinforce and expand taught elements of the course. This will be a combination of open ended assignments and analytical/numerical based problem solving. Coursework

will be assessed on the rigour and quality of the reports with merit given to diligence and evidence of understanding of the underlying methods.

Assessment by Dissertation/Literature Review:

- The ability to plan, structure and manage a detailed study of relevant literature within a defined topic;
- The ability to analyse and where appropriate to relate to the work of others and to be self critical;
- To communicate the dissertation in an oral presentation and in a technical and well presented document.

Assessment by MSc Thesis/Paper:

- The ability to define the project by reference to scientific, technical and/or commercial literature, the critical appraisal of such literature and the justification of the research;
- The ability to plan and manage the research programme, to define the work to be carried out and to report the results in a clear manner;
- The ability to analyse the work, relate it to the work of others where appropriate and to be self-critical;
- To communicate the work, its results and analysis in a technical and well-presented document.

Oral components of Dissertation (Literature Review) and Thesis (Paper):

- Students are required to make a formal presentation on his/her projects which will be assessed by two academics.

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

(Module numbers should correspond with those used in the Course module table above.)

A. Postgraduate Certificate

Award ILOs / **Module No.**	ILO1	ILO2	ILO3	ILO4
2	EX	EX		
3	ICW			ICW
4				ICW
5	ICW		ICW	
6	ICW	ICW		
7	ICW	ICW	ICW	ICW
8		ICW	ICW	
9	ICW		ICW	

B. Postgraduate Diploma

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs / Module No.	ILO5
10	IPROJ IPRES

C. MSc

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs / Module No.	ILO6	ILO7
11	THESIS OR	THESIS OR

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	Modules Covered	Assessment	
		Type	Weight (%)
N/A			

9. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who provides authoritative guidance on policy and procedure to the Panel. Proposals are reviewed in line with the UK Quality Code for Higher Education. New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

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As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

10. What opportunities are graduates likely to have on completing the course?

Graduates from the course will be equipped with the academic skills and requirements to successfully pursue a career in management of engineering projects.

COURSE SPECIFICATION

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

Date of first publication/latest revision: 05/02/2020 / June 2024

1. What is the course?

Course information

Course Title	MSc in Environmental Engineering
Course code	MSc – MSEEJFTC PgDip (exit route only) – PDEEJFTC PgCert (exit route only) - PCEEJFTC
Academic Year	2023/2024
Valid entry routes	MSc
Additional exit routes	PgDip, PgCert
Mode of delivery	Full Time
Location(s)[1] of Study	Jiangsu University Cranfield Tech Futures Graduate Institute, China. (with an optional 6 month 'excursion' at Cranfield)
School(s)	Jiangsu University Cranfield Tech Futures Graduate Institute affiliated with the School of Water, Energy and Environment
Theme	Water, Environment and Agrifood
Centre	Agricultural & Environmental
Course Director	Dr Tao Lyu
Awarding Body	Cranfield University
Is this an AP Contract course?[2]	No
Is this course offered as a Cranfield Mastership?	No
Apprenticeship Standard the course is mapped to	N/A
Is the Degree apprenticeship integrated or non-integrated?	N/A
Is the Mastership offered as an open and/or closed course?	N/A

[1] If any part of this course is delivered at another site, please note which one(s) here
[2] AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Teaching Institution	Jiangsu University Cranfield Tech Futures Graduate Institute
Admissions body	Cranfield University and Jiangsu University
Entry requirements	Standard University entry requirements
UK Qualifications Framework Level	QAA FHEQ Level 7
Benchmark Statement(s)	N/A
Registration Period(s) available	3 years Full-time MSc
Course Start Month(s)	September

Institutions delivering the course

This course is delivered by Jiangsu University (JSU) Cranfield Tech Futures Graduate Institute" which is a formal collaboration between Cranfield and Jiangsu Universities. It has a formal semi-autonomous status as a Chinese-centred Institute that benefits from Cranfield academic input. It has been heavily sponsored by the Jiangsu Provincial Department of Education (the regional education body) and has the formal approval from the Ministry of Education in China.

Research interests include Water pollution control; air pollution control; circular waste management, catchment management, environmental sustainability assessment.

Cranfield University interacts with the following institutions and in the following ways:

- Jiangsu University as part of the Jiangsu University (JSU) Cranfield Tech Futures Graduate Institute

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This course is not accredited by any external bodies.

2. What are the aims of the course?

This course covers the application of scientific and engineering principles for the protection and improvement of environmental quality alongside protecting and enhancing quality of human life at global scale. The course will provide students with the skills needed for the green economy to provide sustainable future technology transitions.

On completion of the course an MSc graduate will be equipped to: 1) Acquire an advanced theoretical and specialist understanding of processes and practices central to environmental engineering; 2) A unique set of knowledge and skills which will enable them to apply appropriate existing and emerging technologies to solve a wide range of environmental engineering problems, including municipal and industrial waste management, process emissions, and catchment contaminations; 3) International vision to design the remediation approaches that can achieve lower environmental impacts via an integrated and cross-disciplinary approach; 4) Enable the application of scientific, technical and engineering principles, economic consequences and risks of environmental management options as best practice to identify sustainable future technologies.

This programme is intended for the following range of students:

1. Graduates with environmental science and engineering education background or other related degrees keen to pursue a higher career in the area of environmental management or waste management.

2. Graduates currently in employment keen to extend their qualifications or to pursue a career change.
3. Individuals with other qualifications but who possess considerable relevant experience.

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate in Environmental Engineering

In completing this course, and achieving the associated award, a diligent student should be able to:

ILO 1. Critically evaluate the principal sources, risk and environmental impacts of pollution along with the importance of pollution control and management

ILO 2. Evaluate the key processes, technologies and engineering principles used to evaluate impacts of pollution on aspects of ecosystem function and natural environmental management.

ILO 3. Critically evaluate sustainable environmental engineering concepts and principles in order to design practical solutions to key environmental problems to a range of industrial and commercial contexts.

B. Postgraduate Diploma in Environmental Engineering

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

ILO 4. Integrate knowledge, understanding and skills from the taught modules into a real-life situation to address problems faced by engineers. This will include a detailed review of the literature related to this problem, with the student providing insight and communicating the findings in a professional manner in written, oral, or visual forms as required.

C. MSc in Environmental Engineering

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

ILO 5. Define a research question, develop aim(s) and objectives, select and execute a methodology, analyse data, evaluate findings critically and draw justifiable conclusions, demonstrating self-reflection and originality of thought.

ILO 6. Communicate their individual research via an academic paper (thesis), thus demonstrating a presentation style suitable for academic and professional audiences.

4. How is the course taught?

Students will be supported in their learning and personal development by:

Engaging with the wider learning environment at Cranfield and Jiangsu through attendance of seminars, lectures, workshops and other learning activities. The students will have access to the e learning support through the VLE.

The taught programme is generally delivered from September and is divided into 9 modules (5 delivered by Cranfield and 4 by Jiangsu). All modules will be taught at the JSU CU Joint Institute at Jiangsu University, China. Modules taught by JSU staff are delivered over a full semester. Modules delivered by CU staff are delivered over one or two weeks in a flying faculty model, with additional online tutorials provided post-delivery by CU staff and face to face support by JSU teaching assistants.

The dissertation/literature review and thesis/paper components are supported through student supervision meetings with both JSU and CU academic supervisors. These will be both face to face and online.

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 6. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. Postgraduate Certificate

The accumulation of 60 credits through the assessment of taught modules as detailed below:

Description	**Credits**
COMPULSORY MODULES:	
Induction Week	AO
ELECTIVE MODULES:	
Any 6 modules (60 credits) from:	
Catchment Management (CU delivery)	10
Waste Management in a Circular Economy: Reuse, Recycle, Recover & Dispose (CU delivery)	10
Integrated Water Management in Cities and Catchments (CU delivery)	10
Process Emission and Control (CU delivery)	10
Sustainability and Environmental Assessment (CU delivery)	10
Engineering Mathematics (JSU delivery)	10
Engineering Ethics (JSU delivery)	10
Frontiers of Environmental Science & Engineering (JSU delivery)	10
Experiments of Environmental Safety Detection and Analysis (JSU delivery)	10
TOTAL:	**60**

B. Postgraduate Diploma

The accumulation of 120 credits through the assessment of taught modules as detailed below:

Description	**Credits**
COMPULSORY MODULES:	
Induction Week	AO
Catchment Management (CU delivery)	10
Waste Management in a Circular Economy: Reuse, Recycle, Recover & Dispose (CU delivery)	10
Integrated Water Management in Cities and Catchments (CU delivery)	10
Process Emission and Control (CU delivery)	10
Sustainability and Environmental Assessment (CU delivery)	10
Engineering Mathematics (JSU delivery)	10
Engineering Ethics (JSU delivery)	10
Dissertation (Critical Literature Review)	40
ELECTIVE MODULES:	
Select 1 module from:	
Frontiers of Environmental Science & Engineering (JSU delivery)	10
Experiments of Environmental Safety Detection and Analysis (JSU delivery)	10
TOTAL:	120

C. MSc

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	Credits
COMPULSORY MODULES:	
Induction Week	AO
Catchment Management (CU delivery)	10
Waste Management in a Circular Economy: Reuse, Recycle, Recover & Dispose (CU delivery)	10
Integrated Water Management in Cities and Catchments (CU delivery)	10
Process Emission and Control (CU delivery)	10
Sustainability and Environmental Assessment (CU delivery)	10
Engineering Mathematics (JSU delivery)	10
Engineering Ethics (JSU delivery)	10
Dissertation (Critical Literature Review)	40
Thesis (Academic Paper)	80
ELECTIVE MODULES:	
Select 1 module from:	
Frontiers of Environmental Science & Engineering (JSU delivery)	10
Experiments of Environmental Safety Detection and Analysis (JSU delivery)	10
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of ≥50%;
- An average mark of ≥50% across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee); [3]
- **For Taught Assessments,** the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
  - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of ≥50% across the taught assessments);
  - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will

[3] Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of <40% (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award (<50%).

be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
    - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥40 credits, which are not part of the taught assessment average), the pass mark of ≥50% (where they exist);
- **For the thesis,** a mark of ≥50% in order to receive a pass (where it exists).

6. How is the course structured?

Part-time students register for the course in September and are expected to complete the course within 3 years.

The students will be registered part-time for the course, starting in September and are expected to complete this section of the course within 36 calendar months.

Taught part 1: Modules
Each Cranfield module is delivered over approximately five days, using a combination of teaching activities and a blended learning approach. The Jiangsu Institute modules are delivered across the entire semester. Taught modules are delivered at the JSU CU Institute at Jiangsu University. One exam will be held at a determined point of the academic calendar.

Taught part 2: Literature Review / Dissertation
The literature review/dissertation consists of a total of 10 contact hours with a member(s) of the teaching staff and 390 hours of private study. Students will be assigned two supervisors by the Course Director and will agree with these supervisors an appropriate topic of study. This may be related to a future workplace/industrial area of interest that is relevant to the student's career plan. This aspect will include a comprehensive literature review of classical and contemporary related material and also a discussion and properly argued conclusions. Where appropriate the review/dissertation will acknowledge the work and contribution of others. This module will be assessed by a formal report.

Taught Part 3: Thesis/Paper
Students will produce a thesis / paper. This consists of a total of 20 contact hours with a member(s) of the teaching staff and 780 hours of private study. Thesis supervisors will be allocated to the students by the Course Director and the two will confirm a suitable topic for study. Within this time, they will produce an academic paper in a journal style relevant to their area of interest (decided in consultation with their supervisor). All students are required and must maintain regular contact (meetings, telephone conversations or e-mail correspondence) with their personal supervisor to discuss progress.

Postgraduate Diploma (PgDip) and Postgraduate Certificate (PgCert) exit routes are provided for students who wish to access only parts of the course provided.

7. Course Level Assessment Strategy[4]

Modules are organised chronologically so that the student can build on existing skills such that they can enter their chosen career with new skills attained. Formative and summative assessments assist with the delivery of both the course and module level ILOs. Formative assessment for all modules assist the students with their summative assignments. Formative feedback sessions are organised to inform students regarding what they need to do for a good summative assignment, including what they have done well in the formative assessment, and what they need to improve for a good summative assignment.

[4] Guidance to aid colleagues writing or updating a course-level assessment strategy for inclusion in the Course Specification can be found as Appendix K in either the Senate Handbook on Setting up a New Taught Course or the Senate Handbook on Managing Taught Courses https://intranet.cranfield.ac.uk/EducationServices/Pages/SenateHandbooksA-Z.aspx

There are various methods of formative assessment; all consist of instant feedback from peers as well as the module lead. For example, “Catchment Management” and “Catchment Management” deliver formative assessment continually throughout the module, whereas “Process Emission and Control” delivers formative assessment at the end of the module. The relevance of formative assessment to industry is enhanced by including industrial partners in discussions (for “Circular Waste Management”).

There is one exam for "Engineering Mathematics", other summative assessment is delivered through individual coursework. Assignments include casework studies such that they can apply attained knowledge in real industrial scenarios while building on their experience from previous modules. Feedback from summative assessments is delivered to students within 20 working days after the submission.

Dissertation (Critical Literature Review):
The Literature Review/Dissertation provides the students with the opportunity to research, in depth, an area of engineering interest to them. It is expected that the review/dissertation will normally consist of the following elements: Abstract, Background context, Introduction to the theme(s) addressed within the dissertation and setting out the issues that will be covered, Methodology, In depth analysis/discussion of the topics discussed, Concluding remarks, References, Appendices (if relevant). Two supervisors are allocated to the dissertation and supervision follows the model used for the independent research project. The student will submit an 8,000 word report and will give an oral presentation of their work. Both elements of assessment will be marked by independent assessors.

Thesis (Academic Paper):
The thesis project requires students to further develop a problem definition, set a hypothesis, select and execute a methodology, analyse data, and evaluate findings and draw appropriate conclusions in the context of research questions relevant to the courses following this module. The student is then required to communicate their findings successfully via a thesis, written in the style of a scientific paper (12,000 words), and an oral presentation. The projects are designed to integrate knowledge, the taught modules, and apply understanding and skills from the dissertation, to deliver a high-quality written thesis and oral presentation.

Course modules

The following modules outline all parts of the programme leading to MSc Environmental Engineering. Other awards associated with the course include some or all of these modules.

Module Number	Module code	Title	Module Leader	Contact hours[5]	Total hours delivered by Visiting[6]	Credits	Is the module shared? Y/N	Calendar			Assessment				
								Module Start Date	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[7] - 40% or 50%	Assessment		Submission dates	
													Weighting within module (%) of[8]	Assessment Submission and/or[9]	Assessment / Exam Retake
1	J-JSU-INDWK	Induction Week – Part 1 Part 2	Adriana Encinas-Oropesa	24		0	Y		04/09/23 26/02/24	08/09/23 01/03/24	N/A	AO	N/A	N/A	N/A
2	J-EGM-EE Occ C23	Engineering Ethics	Ding Hua	32		10	Y		18/12/23	29/12/23	40	ICW	100	20/01/24	
3	J-MEE-EM	Engineering Mathematics	Tan YiLan	24		10	Y		09/10/23	27/10/23	40	EX	100	07/01/24	
4	J-ENE-ESDA	Experiments of Environmental Safety Detection and Analysis	Wang Songmei	24		10	N		16/10/23	03/11/23	40	ICW	100	30/12/23	
5	J-ENE-FESE	Frontiers of Environmental Science and Engineering	Xu Wanzhen	25		10	Y		06/11/23	17/11/23	40	ICW	100	12/12/23	
6	J-ENE-IWMCC	Integrated Water Management in Cities and Catchments	Robert Grabowski	54		10	N		04/03/24	15/03/24	40	ICW	100	13/04/24	
7	I-EI-A1005 Occ B	Catchment Management	Robert Simmons	35		10	Y		18/03/24	22/03/24	40	ICW	100	30/03/24	
8	I-WRM-CRM Occ B	Waste Management in a Circular Economy: Reuse, Recycle, Recover and Dispose	Frederic Coulon	29		10	Y		15/04/24	19/04/24	40	ICW	100	18/05/24	

[5] Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice

[6] Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)

[7] A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.

[8] For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education.

[9] Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

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								Module Start Date	Module Delivery Start Date	Module Delivery nd Date	Minimum Mark[7] - 40% or 50%	Assessment		Submission dates	
													Weighting within module[8] (%) of	Assessment Submission and/or	Assessment / Exam Retake
9	N-ACE-SEA Occ B	Sustainability and Environmental Assessment	Georgios Pexas	25		10	Y		06/05/24	10/05/24	40	ICW	100	15/06/24	
10	I-IWM-A1500 Occ B	Process Emissions and Control	Zaheer Naser	25		10	Y		27/05/24	31/05/24	40	ICW	100	22/06/24	
11	J-JSU-DISS	Dissertation (Critical Literature review	Adriana Encinas-Oropesa	10		40	Y		02/09/24	29/11/24	50	IPROJ IPRES	80 20	29/11/24	
12	J-JSU-THESIS	Thesis (Academic paper)	Adriana Encinas-Oropesa	20		80	Y		02/12/24	14/06/25	50	THESIS OR	90 10	13/06/25	

Please list all modules that are used by another existing course.

Module code	**Module title**	**Course that owns the module**	**Other course(s)/ programme(s) that use the module**
J-JSU-INDWK	Induction Week	Agricultural Engineering	Mechanical Engineering Environmental Engineering Engineering Management Energy Systems and Thermal Processes Environmental Engineering and Environmental Management Materials and Corrosion for Energy Systems
I-WRM-CRM	Waste Management in a Circular Economy: Reuse, Recycle, Recover & Dispose	Environmental Engineering (Cranfield)	Environmental Engineering (Jiangsu) EngD Sustainable Materials and Manufacturing
I-EI-A1005	Catchment Management	Environmental Engineering (Cranfield)	Environmental Engineering (Jiangsu)
I-IWM-A1500	Process Emission and Control	Environmental Engineering (Cranfield)	Environmental Engineering (Jiangsu)
N-ACE-SEA	Sustainability and Environmental Assessment	Renewable Energy (Management route)	Future Food Sustainability Global Environmental Change Environmental Management for Business Environmental Engineering (Jiangsu) Renewable Energy (Management route) Sustainability Level 7 Apprenticeship
J-EGM-EE	Engineering Ethics	Engineering Management	Engineering Management Environmental Engineering (Jiangsu) Mechanical Engineering
J-MEE-EM	Engineering Mathematics	Mechenical Engineering	Environmental Engineering (Jiangsu) Mechanical Engineering
J-ENE-FESE	Frontiers of Environmental Science & Engineering	Environmental Engineering	Environmental Engineering (Jiangsu) PhD Environmental Engineering and Environmental Management
J-JSU-DISS	Dissertation	Agricultural Engineering	Environmental Engineering (Jiangsu) Mechanical Engineering Engineering Management

J-JSU-THESIS	Thesis	Agricultural Engineering	Environmental Engineering (Jiangsu) Mechanical Engineering Engineering Management

8. How are the ILOs assessed?

The following assessment types are utilised:

- The taught modules are assessed by in-module assessment (including coursework, which focuses on application of principles studied knowledge) or examination in January;
- The Dissertation - Critical Literature Review is assessed by means of a written report and presentations;
- The Thesis - Academic paper is assessed by a thesis and an oral examination.

The overall assessment workload and type used for the course is balanced and appropriate; it covers well the ILOs set out for each module of the course and develops the type of skills required for the students for their future career

This approach has been adopted because:

Assessment by Exams:
The underlying assessment strategy across all modules will be to examine the understanding of environmental engineering principles and applications. This will be achieved by testing the ability to solve realistic multi-disciplinary problems within an Environmental Engineering context. Proper application and appreciation of mechanical engineering models and methodologies will be paramount to the successful completion of the course.

Assessment by Coursework:
Coursework will be set to reinforce and expand taught elements of the course. This will be a combination of open ended assignments and analytical/numerical based problem solving. Coursework will be assessed on the rigour and quality of the reports with merit given to diligence and evidence of understanding of the underlying methods.

Assessment by the Dissertation/Literature Review:
- The ability to plan, structure and manage a detailed study of relevant literature within a defined topic;
- The ability to analyse and where appropriate to relate to the work of others and to be self-critical;
- To communicate the dissertation in an oral presentation and in a technical and well-presented document.

Assessment by MSc Thesis/Paper tests:
- The ability to define the project by reference to scientific, technical and/or commercial literature, the critical appraisal of such literature and the justification of the research;
- The ability to plan and manage the research programme, to define the work to be carried out and to report the results in a clear manner;
- The ability to analyse the work, relate it to the work of others where appropriate and to be self-critical;
- To communicate the work, its results and analysis in a technical and well-presented document.

Oral components of Dissertation (Literature Review) and Thesis (Paper):
- Students are required to make a formal presentation on his/her projects which will be assessed by two academics.

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

(Module numbers should correspond with those used in the Course module table above.)

A. Postgraduate Certificate

Award ILOs / **Module No.**	ILO1	ILO2	ILO3
2	ICW	ICW	ICW
3			ICW
4	EX		
5		ICW	
6	ICW	ICW	ICW
7	ICW	ICW	
8	ICW		ICW
9	ICW	ICW	ICW
10		ICW	ICW

B. Postgraduate Diploma

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs / **Module No.**	ILO4
11	IPROJ IPRES

C. MSc

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs / **Module No.**	ILO5	ILO6
12	THESIS OR	THESIS OR

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	**Modules Covered**	**Assessment**	
		Type	Weight (%)
N/A			

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As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

10. What opportunities are graduates likely to have on completing the course?

On completion, graduates have a broader network of global contacts, increased opportunities for individual opportunities and a wide range of careers as professional scientists and engineers in the environment sector.

Graduants from the related MSc Environmental Engineering course at Cranfield University over the last three years have been employed by the following companies:

Golder Associates
Arup
Seche Environment
EnvironTech Gmbh
Deloitte
BP
Chevron
WSP
Jacobs
Viridor
Syngenta
Schofield Lothian
SOCOTEC UK
McKinsey and Company
Mondelēz International

COURSE SPECIFICATION

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

Date of first publication/latest revision: June 2024

1. What is the course?

Course information

Course Title	Environmental Engineering
Course code	MSEENFTC, MSEENPTC, PDEENFTC, PDEENPTC, PCEENFTC, PCEENPTC
Academic Year	2023/24
Valid entry routes	MSc, PgDip, PgCert
Additional exit routes	PgDip, PgCert
Mode of delivery	Full-time, Part-time
Location(s)[1] of Study	Cranfield University (Main Campus)
School(s)	School of Water, Energy and Environment
Theme	Environment & Agrifood
Centre	Cranfield Environment Centre
Course Director	Dr Zaheer Nasar
Awarding Body	Cranfield University
Is this an AP Contract course?[2]	No
Is this course offered as a Cranfield Mastership?	No
Apprenticeship Standard the course is mapped to	N/A
Is the Degree apprenticeship integrated or non-integrated?	N/A
Is the Mastership offered as an open and/or closed course?	N/A
Teaching Institution	Cranfield University

[1] If any part of this course is delivered at another site, please note which one(s) here
[2] AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Admissions body	Cranfield University
Entry requirements	1st or 2nd class UK honours degree or equivalent; in a science or engineering subject; Candidates with other qualifications will be considered according to experience; Where applicable minimum IELTS score of 6.5 or TOEFL 580
UK Qualifications Framework Level	QAA FHEQ Level 7 (Masters)
Benchmark Statement(s)	N/A
Registration Period(s) available	Full-time MSc - one year, Part-time MSc - up to three years, Full-time PgCert - one year, Part-time PgCert - two years, Full-time PgDip - one year, Part-time PgDip - two years
Course Start Month(s)	Full-time: October Part-time: Throughout the year preferably October

Institutions delivering the course

This course is delivered by School of Water, Energy and Environment where the research interests include:
Municipal and hazardous waste management, process emissions, contaminated land, water, wastewater treatment and waste disposal.

Cranfield University actively seeks sponsorship and support for individual thesis projects from water and resource sector employers to provide professional experience and development opportunities for students. Thesis sponsors and supporters include: Waste Resources Action Programme (WRAP), Viridor, Chartered Institution of Waste Management (CIWM), Environment Agency, Department for Environment, Food and Rural Affairs (Defra), Severn Trent Water, Anglian Water, Golder Associates, RSK, Arup, Mott MacDonald, Unilever, Future Biogas, Aquatrols, Soil Association, Royal Geographical Society, Sports Turf Research Institute, Bee Safe Bio-Tech ltd, Terravesta ltd, Flood Re, Royal Horticultural Society PepsiCo, FSA, It's Fresh

Cranfield University has agreements with a number of top quality European higher education institutions through its European Partnership Programme (EPP). Within these agreements students from partner institutions have the opportunity to take a Master of Science (MSc) at Cranfield University as an alternative to the final year of their home university programme.

In order to be eligible to apply for direct entry to Cranfield University Master of Science programmes, students from Enviornmental Engineering course must have successfully completed:

- For dual degree programme:
  - Year 1 of Masters programme; or
- For non dual degree programme:
  - a bachelor degree in the relevant field.

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This course is accredited formally by the Chartered Institution of Water and Environmental Management (CIWEM) until September 2027and the Institution of Agricultural Engineers (IAgrE) until 2025. Students can gain membership for one year.

2. What are the aims of the course?

Cranfield University offers these courses in order to:

Cover the application of scientific and engineering principles for the protection and improvement of environmental quality alongside protecting and enhancing quality of human life at both local, landscape and global scales. Specifically, the MSc will equip students with a unique set of knowledge and skills which will enable them to solve a wide range of environmental engineering problems including municipal and toxic waste management, process emissions, contaminated land and water and waste disposal. The programme will also address energy and resource recovery from waste materials.

On completion of the course an MSc graduate will be equipped to:

- Acquire an advanced theoretical and specialist understanding of processes and practices central to environmental engineering
- Select and apply appropriate existing and emerging technologies that can achieve lower environmental impact via an integrated and cross-disciplinary approach
- Enable the application of scientific, technical and engineering principles, economic consequences and risks of environmental management options as best practice
- Develop the capacity to undertake successful technical research projects using appropriate methods of critical analysis.

This programme is intended for the following range of students:

- graduates with science, engineering, geography or related degrees keen to pursue careers in environmental management or waste management
- graduates currently in employment keen to extend their qualifications or to pursue a career change
- individuals with other qualifications but who possess considerable relevant experience

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate in Environmental Engineering

In completing this course, and achieving the associated award, a diligent student should be able to:

ILO 1. Evaluate the key processes operating in the natural environment and the general biological, physical and engineering principles that underpin relevant aspects of ecosystem function and natural environmental management.

ILO 2. Critically evaluate the principal sources, risk and environmental impact of waste and pollution generation along with the importance of pollution control and the principles of sustainable energy and materials use.

ILO 3. Critically evaluate sustainable environmental engineering concepts and principles in order to design practical environmental management solutions, taking into account social, environmental, technical, regulatory and commercial constraints to a range of industrial and commercial contexts.

B. Postgraduate Diploma in Environmental Engineering

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

ILO 4. Integrate knowledge, understanding and skills from the taught modules in a real-life situation to address problems faced by industrial clients; creating new problem diagnoses, designs, or system insights; and communicating findings in a professional manner in written, oral and visual forms.

C. MSc in Environmental Engineering

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

ILO 5. Define a research question, develop aim(s) and objectives, select and execute a methodology, analyse data, evaluate findings critically and draw justifiable conclusions, demonstrating self-direction and originality of thought.

ILO 6. To communicate their individual research via a thesis and in an oral presentation in a style suitable for academic and professional audiences.

4. How is the course taught?

Students will be supported in their learning and personal development by:

The MSc course is taught in three sections: taught modules (40%), group projects (20%), and an individual research project (40%).

The taught programme, typically delivered between October and February, comprises a structured sequence of modules, each containing a series of lectures and other classroom-based teaching, supplemented by practical work. The taught modules are assessed by assignments. Each module is taught over one week, usually followed by an assimilation week largely free of structured teaching to allow time for more independent learning and reflection.

The Group Projects are group-based research program typically undertaken between February and April. The projects are designed to integrate knowledge, understanding and skills from the taught modules in a real-life situation.

The thesis project, typically delivered between May and September, further develops research and project management skills that: provide the ability to think and work in an original way; contribute to knowledge; overcome genuine problems; and communicate through a thesis and oral exam. Each student is allocated a supervisor, who will guide and assess the student work.
Guidance sessions are provided as to what is required from thesis and oral presentation.

Within induction week, students will be introduced to personal development planning and asked to reflect on their transferable skills and to take ownership of their personal development during the course.

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 8. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. Postgraduate Certificate

The accumulation of 60 credits through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	

Induction Week Environmental Risks: Hazard, Assessment and Management Process Emissions and Control Waste Management in a Circular Economy: Recycle, Recover, and Dispose Land Engineering Principles and Practices Pollution Prevention and Remediation Technologies Cleantech in Water-Energy Food Nexus	0 10 10 10 10 10 10
ELECTIVE MODULES:	
N/A	
TOTAL:	60

B. Postgraduate Diploma

The accumulation of 120 credits through the assessment of taught modules as detailed below:

Description	**Credits**
COMPULSORY MODULES:	
Induction Week Environmental Risks: Hazard, Assessment and Management Modelling Environmental Processes Process Emissions and Control Waste Management in a Circular Economy: Recycle, Recover, and Dispose Land Engineering Principles and Practices Pollution Prevention and Remediation Technologies Cleantech in Water-Energy Food Nexus Catchment Management Group Project (Full Time Students)	0 10 10 10 10 10 10 10 10 40
ELECTIVE MODULES:	
Part Time Students: Group Project OR Dissertation	 40 40
TOTAL:	120

C. MSc

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	**Credits**
COMPULSORY MODULES:	
Induction Week Environmental Risks: Hazard, Assessment and Management Modelling Environmental Processes Process Emissions and Control Waste Management in a Circular Economy: Recycle, Recover, and Dispose Land Engineering Principles and Practices Pollution Prevention and Remediation Technologies Cleantech in Water-Energy Food Nexus	0 10 10 10 10 10 10 10

Catchment Management Group Project (Full Time Students) Individual Thesis Project	10 40 80
ELECTIVE MODULES:	
Part Time Students: Group Project OR Dissertation	 40 40
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria
The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of ≥50%;
- An average mark of ≥50% across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee); [3]
- **For Taught Assessments,** the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
  - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of ≥50% across the taught assessments);
  - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
  - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥40 credits, which are not part of the taught assessment average), the pass mark of ≥50% (where they exist);
- **For the thesis,** a mark of ≥50% in order to receive a pass (where it exists).

6. How is the course structured?

[3] Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of <40% (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award (<50%).

Full-time students register for the course in October and are expected to complete the course within 12 calendar months.

All options are also offered on a part-time basis and such students are expected to complete the course within 2 to 3 years. Part-time students are not restricted to starting in October. Instead they are offered individual guidance on the best sequence of study based on their prior knowledge and availability to attend.

Part time students would be strongly encouraged to join the course at the start of the new academic year to coincide with induction for full time students. If they however join in year then ad hoc induction sessions can be arranged as required

7. Course Level Assessment Strategy[4]

Formative and summative assessments assist with the delivery of both the course and module level ILOs. Formative assessment for all modules assist the students with their summative assignments. Formative feedback sessions are organised to inform students regarding what they need to do for a good summative assignment, including what they have done well in the formative assessment, and what they need to improve for a good summative assignment.

There are various methods of formative assessment; all consist of instant feedback from peers as well as the module lead. For example, “Catchment Management” delivers formative assessment continually throughout the module, whereas “Environmental Risks: Hazard, Assessment and Management” delivers formative assessment at the end of the module in the style of group workshops. In the module “Land Engineering Principles and Practices” formative assessment is carried out in groups guided by the module leader. The relevance of formative assessment to industry is enhanced by including industrial partners in discussions where feasible (e.g., for “Pollution Prevention and Remediation Technologies” and “Waste Management in a Circular Economy: Reuse, Recycle, Recover & Dispose”). The “Land Engineering Principles and Practices” module includes a visit to a field site to ensure industrial relevance.

There are no exams within this course; all summative assessment is delivered through individual coursework. Exams would not reflect the skills that the students has attained, and do not reflect their ability to utilise resources to integrate knowledge for problem solving. Assignments include casework studies such that they can apply attained knowledge in real industrial scenarios while building on their experience from previous modules. Feedback from summative assessments is delivered to students within 20 working days.

Group Project: The group project provides the students with the opportunity to gain professional skills expected of the workplace. In addition to technical skill practice, students develop a range of soft skills such as team working, problem solving, communication skills and reflective practice. The students work in small consultancy teams typically on a client sponsored project for a period of 10 weeks. Many teams will be made up of students from different courses giving the students the opportunity of working in an interdisciplinary team. The students are responsible for interpreting the brief, developing a project plan, selecting and implementing a methodology, deriving results, analysing the results and drawing conclusions in alignment with the aims and objectives. All students participate in a peer review activity providing them with the opportunity to reflect on the practices of their colleagues as well as their own. Peer review feedback is provided individually by an independent member of academic staff. A single group report is produced and the project is presented orally at the concluding Exhibition Day, both elements are summatively assessed by independent markers and a group mark is assigned for element. Individual assessment is derived

[4] Guidance to aid colleagues writing or updating a course-level assessment strategy for inclusion in the Course Specification can be found as Appendix K in either the Senate Handbook on Setting up a New Taught Course or the Senate Handbook on Managing Taught Courses
https://intranet.cranfield.ac.uk/EducationServices/Pages/SenateHandbooksA-Z.aspx

from supervisor observation and meeting minute actions and an individual reflective report where the students reflect on the development of three soft skill competencies based on objectives that they set for themselves. The team working competency is mandatory as one of the three skills for each student.

Dissertation: Part time students are not required to complete the Group Project undertaken by the full time registered students on a SWEE MSc course. An alternative assignment takes the form of a dissertation or design project which in most situations will be based around a topic relevant to the work of the part-time student. It is evident that some aspects of the Group Project experience that the work-based dissertation replaces – for example the client interaction and group dynamics components will not directly replicated by undertaking this assignment. It is expected that these experiences would normally be a part of the normal working life of the part-time student.

It is expected that the dissertation will normally consist of the following elements: Abstract, Background context, Introduction to the theme(s) addressed within the dissertation, setting out the issues that will be covered, Methodology, In depth analysis/discussion of the topics discussed, Concluding remarks, References, Appendices (if relevant). One supervisor is allocated to the dissertation and supervision follows the model used for the independent research project. The student will submit a 6000 word report and will give an oral presentation of their work. Both elements of assessment will be marked by independent assessors.

Individual Research Project/Thesis: The individual research project requires students to further develop problem definition, hypothesis setting, select and execute a methodology, analyse data, and evaluate findings and draw appropriate conclusions in the context of research questions relevant to the course followed by a student. The student is required to communicate their findings successfully via a thesis, written in the style of a scientific paper (less than 8000 words), and an oral presentation based around a poster. The projects are designed to integrate knowledge, the taught modules, and apply understanding and skills from the group project, to deliver a high quality written thesis and oral presentation. The individual research project/thesis is typically delivered through collaboration with an industrial sponsor, or it may be an ‘internal’ project reflecting the research interests of the School.

Course modules

The following modules outline all parts of the programme leading to **MSc.** Other awards associated with the course include some or all of these modules.

Module Number	Module code	Title	Module Leader	Contact hours[5]	Total hours delivered by Visiting Lecturers [6]	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[7] - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module[8] (%) of Independent assessments	Weighting within module of multi-part assessments [9](100%)	Type of Assessment	Weighting of individual elements of multi-part assessment[10]	Assessment Submission and/or exam date[11]	Assessment / Exam Retake date
1	I-ENV-INWK	Induction	Theresa Mercer	33		0	Y		02/10/23	06/10/23	N/A	AO	N/A				N/A	N/A
2	I-ERM-A2005	Environmental Risks: Hazard, Assessment and Management	Abdou Khouakhi	24.5		10	Y		09/10/23	20/10/23	40	ICW	100				FT 21/10/23 PT 04/11/23	05/24

[5] Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice
[6] Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)
[7] A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%. This will be at the Board of Examiners discretion.
[8] For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education
[9] For **multi-part assessments** please record the overall weighting of module which should be 100%. Multipart assessments should only be included in courses where there is a clear androgogical reason and where each element forms part of a continuous learning and assessment experience for students.
[10] Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate*).* If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.
[11] Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours[5]	Total hours delivered by Visiting Lecturers [6]	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[7] - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module[8] (%) of Independent assessments	Weighting within module of multi-part assessments [9](100%)	Type of Assessment	Weighting of individual elements of multi-part assessment[10]	Assessment Submission and/or exam date[11]	Assessment / Exam Retake date
3	I-EI-A1001 Occ A	Modelling Environmental Processes	Ron Corstanje	27		10	Y		23/10/23	03/11/23	40	ICW	100				FT 04/11/23 PT 18/11/23	05/24
4	I-IWM-A1500 Occ A	Process Emissions and Control	Zaheer Nasar	25		10	Y		06/11/23	17/11/23	40	ICW	100				FT 18/11/23 PT 02/12/23	05/24
5	I-WRM-CRM Occ A	Waste Management in a Circular Economy: Reuse, Recycle, Recover and Dispose	Frederic Coulon	29		10	Y		20/11/23	01/12/23	40	ICW	100				FT 02/12/23 PT 06/01/24	05/24
6	I-EI-A1004	Land Engineering Principles and Practices	Lynda Deeks	36		10	Y		04/12/23	15/12/23	40	ICW	100				FT 06/01/24 PT 20/01/24	05/24
7	I-IWM-A1061	Pollution Prevention and Remediation Technologies	Frederic Coulon	29		10	Y		08/01/24	19/01/24	40	ICW	100				FT 20/01/24 PT 03/02/24	05/24
8	I-CTE-CWN	Cleantech in Water-Energy Food Nexus	Frederic Coulon	30		10	Y		22/01/24	02/02/24	40	ICW	100				FT 03/02/24 PT 17/02/24	05/24

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours[5]	Total hours delivered by Visiting Lecturers [6]	Credits	Is the module shared? Y/N	Calendar			Assessment							
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[7] - 40% or 50%	Independent Assessment		Multi-part Assessment			Submission dates	
												Type of Assessment	Weighting within module[8] (%) of Independent assessments	Weighting within module of multi-part assessments [9](100%)	Type of Assessment	Weighting of individual elements of multi-part assessment[10]	Assessment Submission and/or exam date[11]	Assessment / Exam Retake date
9	I-EI-A1005 Occ A	Catchment Management	Robert Simmons	35		10	Y		05/02/24	16/02/24	40	ICW	100				FT 17/02/24 PT 02/03/24	05/24
10	I-SWEE-GRPP	Group Project	Jitka MacAdam	16		40	Y		26/02/24	03/05/24	50 50 50 50	GCW GPRES ICW RP	64 16 10 10				26/04/24 @ 16:00 23/04/24 @ 16:00 03/05/24 @ 16:00 04/05/24 @ 23:59	
11	I-SWEE-DISS	Dissertation (for part time students)	Jitka MacAdam	10		40	Y		26/02/24	20309/24	50	IPROJ IPRES	80 20				20/09/24 @ 16:00 w/c 23/09/24	SEPT 25
12	I-SWEE-THES	Thesis	Jitka MacAdam	20		80	Y		07/05/24	06/09/24	50 50	THESIS OR	90 10				02/09/24 @ 16:00 27/08/24 to 04/09/24	SEPT 25

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Please list all modules that are used by another existing course.

Module code	**Module title**	**Course that owns the module**	**Other course(s)/ programme(s) that use the module**
I-ENV-INWK	Induction week	Environmental Engineering	• Environmental Management for Business • Geographical Information Management • Global Environmental Change
I-WRM-CRM	Waste Management in a Circular Economy: Reuse, Recycle, Recover & Dispose	Environmental Engineering	• EngD Sustainable Materials and Manufacturing • MSc Global Environmental Change • MSc Environmental Engineering (Jiangsu)
I-ERM-A2005	Environmental Risks: Hazard, Assessment and Management	Environmental Engineering	• WIRe CDT • MSc Sustainability
I-EI-A1001	Modelling Environmental Processes	Environmental Engineering	• PhD in Environmental Engineering (Jiangsu)
I-IWM-A1061	Pollution Prevention and Remediation Technologies	Environmental Engineering	• MSc Global Environmental Change • PhD in Environmental Engineering (Jiangsu)
I-EI-A1004	Land Engineering Principles and Practices	Environmental Engineering	• MSc Global Environmental Change •
I-IWM-A1500	Process Emissions and Control	Environmental Engineering	• MSc Global Environmental Change • MSc Environmental Engineering (Jiangsu)
I-CTE-CWN	Cleantech in Water-Energy Food Nexus	Environmental Engineering	• MSc Global Environmental Change
I-EI-A1005	Catchment Management	Environmental Engineering	• MSc Environmental Engineering (Jiangsu)
I-SWEE-GRPP	Group Project	Advanced Water Management	• All SWEE courses
I-SWEE-DISS	Dissertation (part time students)	Advanced Water Management	• All SWEE courses
I-SWEE-THES	Individual Research Project	Advanced Water Management	• All SWEE courses

8. How are the ILOs assessed?

The following assessment types are utilised:

- the taught modules (40%) are assessed by in-module assessment (including coursework, which focuses on application of principles studied knowledge) or examination in January;
- group projects (20%) are assessed by means of a written group report and presentations.
- the research project (40%), is assessed by a thesis and an oral examination

The overall assessment workload and type used for the course is balanced and appropriate; it covers well the ILOs set out for each module of the course and develops the type of skills required for the students for their future career

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

(Module numbers should correspond with those used in the Course module table above.)

A. Postgraduate Certificate in Environmental Engineering

Award ILOs / **Module No.**	ILO 1.	ILO 2.	ILO 3.
I-ERM-A2005	ICW	ICW	ICW
I-WRM-CRM		ICW	ICW
I-IWM-A1061	ICW	ICW	ICW
I-EI-A1004	ICW	ICW	ICW
I-IWM-A1500		ICW	ICW
I-CTE-CWN		ICW	ICW

B. Postgraduate Diploma in Environmental Engineering

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs / **Module No.**	ILO1	ILO2	ILO3	ILO 4.
I-EI-A1001	ICW	ICW	ICW	
I-EI-A1005	ICW	ICW	ICW	
I-ENV-GRPP				GPROJ GPRES ICW RP
I-ENV-DISS				IPROJ IPRES

C. Master of Science in Environmental Engineering

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs / Module No.	ILO 5.	ILO 6.
I-ENV-THESIS	THESIS OR	THESIS OR

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	Modules Covered	Assessment	
		Type	Weight (%)

9. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who provides authoritative guidance on policy and procedure to the Panel. Proposals are reviewed in line with the UK Quality Code for Higher Education. New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guiding principles to meet the Expectations and Core Practices of the UK Quality Code for Higher Education. External examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and

national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the UK Quality Code for Higher Education. The delivery of new partnership provision is ultimately approved by the Universities Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

10. What opportunities are graduates likely to have on completing the course?

On completion, graduates have a broader network of global contacts, increased opportunities for individual opportunities and a wide range of careers as professional scientists and engineers in the environment sector.

Some of the employers over the last three years include:

- Golder Associates
- Arup
- Seche Environment
- EnvironTech Gmbh
- Deloitte
- BP
- Chevron
- WSP
- Jacobs
- Viridor
- Syngenta
- Schofield Lothian
- SOCOTEC UK
- McKinsey and Company
- Mondelēz International

COURSE SPECIFICATION

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

Date of first publication/latest revision: 04/02/21 / June 2024

1. What is the course?

Course information

Course Title	PhD in Environmental Engineering and Environmental Management
Course code	PhD – DPEVEFRC MPhil (exit route only) – MPEVEFRC MSc by Research (exit route only) - MSEVEFRC
Academic Year	2023/2024
Valid entry routes	PhD
Additional exit routes	MPhil, MSc by Research
Mode of delivery	Full-time
Location(s)[1] of Study	Jiangsu University Cranfield Tech Futures Graduate Institute, China. (with an optional 1-year 'excursion' research year at Cranfield)
School(s)	Jiangsu University Cranfield Tech Futures Graduate Institute affiliated with the School of Water, Energy and Environment
Theme	Water, Energy and Environment
Centre	Environment and Agrifood
Course Director	Dr Ying Jiang
Awarding Body	Cranfield University
Teaching Institution	Jiangsu University Cranfield Tech Futures Graduate Institute
Admissions body	Cranfield University and Jiangsu University
Entry requirements	Standard University entry requirements
UK Qualifications Framework Level	QAA FHEQ Level 8 (PhD)
Benchmark Statement(s)	NA
Registration Period(s) available	4 years
Course Start Month(s)	September

[1] If any part of this course is delivered at another site, please note which one(s) here

Institutions delivering the course

This course is delivered by Jiangsu University (JSU) Cranfield Tech Futures Graduate Institute which is a formal collaboration between Cranfield and Jiangsu Universities. It has a formal semi-autonomous status as a Chinese-centred Institute that benefits from Cranfield academic input. It has been heavily sponsored by the Jiangsu Provincial Department of Education (the regional education body) and has the formal approval from the Ministry of Education in China

Research interests include supporting the global green economy by training postgraduates in agricultural, mechanical, power and environmental engineering, as well as in engineering management

Cranfield University interacts with the following institutions and in the following ways:

- Jiangsu University as part of the Jiangsu University (JSU) Cranfield Tech Futures Graduate Institute

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This course is not accredited by any external bodies.

2. What are the aims of the course?

China currently faces serious environmental issues, along with many other countries. There is a significant global push towards sustainable development and the use of green technologies. This needs to be supported by skilled environmental professionals with an international vision, in-depth understanding of the development direction at the frontiers of environmental science. This PhD program will provide environmental scientists with skills needed for the green economy to allow them to become leaders of future green technology transitions.

To facilitate a four-year programme during which the PhD students undertake a research degree awarded for industrially relevant research and supported by a programme of technical taught modules and academic skill development courses. PhD students may leave with an MSc by Research or MPhil at the discretion of the PhD review panel.

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. PhD

In completing this course, and achieving the associated award, a diligent student should be able to:

ILO 1. Initiate and create new knowledge, through original research, delivered to a quality to satisfy peer review
ILO 2. Conceptualise, design and implement methods for the collection of new knowledge
ILO 3. Demonstrate a systematic approach to the interpretation of knowledge in an academic discipline

4. How is the course taught?

Students will be supported in their learning and personal development by:

This PhD course is a 4-year programme with a combination of taught and research elements. Taught modules and academic practicals usually take place in the 1st academic year, to provide students with the necessary background knowledge and academic skills to carry out the PhD research. The taught

elements will be followed by a significant research programme of the degree study jointly supervised by Cranfield University and Jiangsu University supervisors.

In addition to the taught element, the students are required to complete a series of academic practicals including: Journal paper writing and preparation for peer review process, Academic Lectures, seminar and International conference attendance, Critical literature review, and academic practice on teaching and supervision. These practical sessions are designed to equip students with the necessary academic skills for the research programme and also to support students in achieving the mandatory journal paper publication requirements set by the Ministry of Education in China for PhD level study.

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 6. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

PhD
The award of the PhD is determined by examination of a PhD thesis and by viva voce.

Credits
The accumulation of up to 65 credits through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Induction Week	AO
Mathematical Models and Applications (JSU delivery)	10
Advanced Water Management (CU delivery)	15
Modelling Environmental Processes (CU delivery)	10
Pollution Prevention and Remediation Technologies (CU delivery)	10
Sustainability and Economic Assessment (CU delivery)	10
Frontiers of Environmental Science & Engineering (JSU delivery)	10
ELECTIVE MODULES:	
N/A	0
TOTAL:	65

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria for Taught Elements

Stand-alone Accredited Modules
Pass mark is 50%
You are expected to pass the module in its own right in order to receive the intended learning credits. If you fail the assessment(s) associated with a stand-alone module you will normally be permitted to re-take the assessment. A re-take assessment would normally be capped at 50% unless exceptional circumstances have been presented and accepted.

6. How is the course structured?

Full-time students register for the course in September and are expected to complete the course within 48 calendar months.

Students register for the course in September and are expected to complete the course within 48 calendar months. No part-time study is offered for this course. 65 credits of approved module training must normally be completed within the first year of the PhD. Candidates are also required to complete two compulsory non-credit-bearing modules. PhD candidates will conduct a single study to be reported in a thesis. Formal assessment will involve a Viva Voce defence of the thesis with one internal examiner and one external examiner, where none of the examiners can have served on the student's supervisory panel.

The PhD students will commence the development of their research proposal during Year 1. A draft research plan will be submitted to the Joint Examination Panel which consists of five academics (x3 Cranfield University and x2 Jiangsu University) at Month 6. The students will submit a final draft PhD proposal and comprehensive literature review as agreed by their supervisory team, prior to the Initial (Year 1) progress review to the Joint Examination Panel. In addition to the standard Postgraduate research student progression requirements at Cranfield University, satisfactory progress on the structured training programme will be assessed by the Joint Examination Panel at Month 12 and subsequently at approximately 12-month intervals. During the research component of the study, students will have the opportunity to spend an optional 'Excursion' study year at Cranfield University subject to the approval of the supervision team.

Taught modules

Module Number	Module code	Title	Module Leader	Contact hours[2]	Total hours delivered by Visiting	Credits	Is the module shared? Y/N	Calendar			Assessment				
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[4] - 40% or 50%	Independent Assessment		Submission dates	
												Type of Assessment	Weighting within module[5] (%) of Independent	Assessment Submission and/or exam	Assessment / Exam Retake date
1	J-JSU-INDWK	Induction Week Part 1 Part 2	Adriana Encinas-Oropesa	24		0	Y		04/09/23 26/02/24	08/09/23 01/03/24	N/A	AO	N/A	N/A	N/A
2	J-EVE-MMA A23	Mathematical Models and Applications	Yu Hongyuan	24		10	Y		23/10/23	10/11/23	50%	ICW	100%	19/01/24	TBC
3	J-ENE-FESE	Frontiers of Environmental Science and Engineering	Xu Wanzhen	25		10	Y		06/11/23	17/11/23	50%	ICW	100%	12/12/23	TBC
4	J-EVE-AWM	Advanced Water Management	Robert Grabowski	54		15	N		04/03/24	15/03/24	50%	ICW	100%	13/04/24	TBC
5	I-IWM-A1061 Occ B	Pollution Prevention and Remediation Technologies	Frederic Coulon	29		10	Y		22/04/24	26/04/24	50%	ICW	100%	25/05/24	TBC
6	N-APE-SEA Occ B	Sustainability and Economic Assessment	Georgios Pexas	25		10	N		06/05/24	10/05/24	50%	ICW	100%	08/06/24	TBC
7	I-EI-A1001 Occ B	Modelling Environmental Processes	Joanna Zawadzka	26		10	Y		13/05/24	17/05/24	50%	ICW	100%	01/06/24	TBC

[2] Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice
[3] Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)
[4] A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.
[5] For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education.
[6] Please ensure you include submission dates for both FT and PT students.

Please list all modules that are used by another existing course.

Module code	**Module title**	**Course that owns the module**	**Other course(s)/ programme(s) that use the module**
J-JSU-INDWK	Induction Week	Agricultural Engineering	Mechanical Engineering Environmental Engineering Engineering Management Energy Systems and Thermal Processes Environmental Engineering and Environmental Management Materials and Corrosion for Energy Systems
J-ETP-MMA	Mathematical Models & Applications	PhD Environmental Engineering and Environmental Management	PhD in Energy Systems and Thermal Processes PhD Materials and Corrosion for Energy Systems
I-IWM-A1061	Pollution Prevention and Remediation Technologies	Environmental Engineering (Cranfield)	PhD in Environmental Engineering and Environmental Management
I-EI-A1001	Modelling Environmental Processes	Environmental Engineering (Cranfield)	PhD in Environmental Engineering and Environmental Management PhD in Environmental Engineering and Environmental Management

J-ENE-FESE	Frontiers of Environmental Science & Engineering	Environmental Engineering	Environmental Engineering (Jiangsu) PhD in Environmental Engineering and Environmental Management

8. How are the ILOs assessed?

The following assessment types are utilised:

The PhD students are expected to undertake five compulsory taught modules, one elective taught module and an Academic Practical programme. There is a requirement for students to undertake these modules; however, the overall PhD is assessed by a viva in-line with the university regulations for a doctorate level research degree

This approach has been adopted because:

It is a requirement of the Ministry of Education in China for Doctoral Training that all students undertake an assessed training programme. However, the only requirement for passing a Cranfield University PhD is the completion of a thesis and a successful viva examination as per the university regulations for doctoral level research. Students will be awarded credits for modules passed by Cranfield University.

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	**Modules Covered**	**Assessment**	
		Type	Weight (%)
N/A			

8. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who provides authoritative guidance on policy and procedure to the Panel. Proposals are reviewed in line with the UK Quality Code for Higher Education. New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guiding principles to meet the Expectations and Core Practices of the UK Quality Code for Higher Education. External examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the UK Quality Code for Higher Education. The delivery of new partnership provision is ultimately approved by the Universities Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

9. What opportunities are graduates likely to have on completing the course?

The student will benefit from the complimentary academic inputs from the UK and China. Following the graduation, it is anticipated that the students will primarily work for Environmental consultancies, Environmental engineering, government bodies and academia in various roles including research, engineering, process science, environmental legislation and regulation.

COURSE SPECIFICATION

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

Date of first publication/latest revision: June 2024

1. What is the course?

Course information

Course Title	Environmental Management for Business
Course code	MSEMBFTC, MSEMBPTC, PDEMBFTC, PDEMBPTC, PCEMBFTC, PCEMBPTC
Academic Year	2023/24
Valid entry routes	MSc, PgDip, PgCert
Additional exit routes	PgDip, PgCert
Mode of delivery	Full-time, Part-time
Location(s)[1] of Study	Cranfield University
School(s)	School of Water, Energy and Environment
Theme	Environment & Agrifood
Centre	Cranfield Environment Centre
Course Director	Dr Alice Johnston
Awarding Body	Cranfield University
Is this an AP Contract course?[2]	No
Is this course offered as a Cranfield Mastership?	No
Apprenticeship Standard the course is mapped to	N/A
Is the Degree apprenticeship integrated or non-integrated?	N/A
Is the Mastership offered as an open and/or closed course?	N/A

[1] If any part of this course is delivered at another site, please note which one(s) here
[2] AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Teaching Institution	Cranfield University
Admissions body	Cranfield University
Entry requirements	This course is suitable for graduates with science, engineering, social science or business related degrees keen to pursue careers in sustainability management; or graduates currently working in industry keen to extend their qualifications; or individuals with other qualifications who possess considerable relevant experience. If you are an international student you will need to provide evidence that you have achieved a satisfactory test result in an English qualification. The minimum standard expected from a number of accepted courses are as follows IELTS - 6.5, TOEFL – 92, Pearson PTE Academic – 65, Cambridge English Scale – 180, Cambridge English: Advanced – C, Cambridge English: Proficiency - C
UK Qualifications Framework Level	QAA FHEQ Level 7 (Masters)
Benchmark Statement(s)	N/A
Registration Period(s) available	Full-time MSc - one year, Part-time MSc - up to three years, Full-time PgCert - one year, Part-time PgCert - two years, Full-time PgDip - one year, Part-time PgDip - two years
Course Start Month(s)	Full-time: October Part-time: October

Institutions delivering the course

This course is delivered by Cranfield Environment Centre, where the research interests include:

Environmental risk analysis, life cycle analysis, ecosystem service assessment, environmental modelling and institutional resilience

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This course is accredited formally by the Chartered Institution of Water and Environmental Management (CIWEM) until September 2027 and the Institute of Environmental Management & Assessment (IEMA), renewed annually in October.

2. What are the aims of the course?

Cranfield University offers this course:

- To provide students with knowledge and understanding of environmental policies, the ability to develop strategies in response to those policies, and basic business management skills to enable them to communicate and implement their strategies.
- To develop an understanding of Sustainable Development and the knowledge of related international, national and local government policies and frameworks, with particular emphasis on natural resources and the environment.
- To develop the capacity to undertake successful technical research projects using appropriate methods of critical analysis.

Postgraduate Diploma (PgDip) and Postgraduate Certificate (PgCert) exit routes are provided for students who wish to access only parts of the course provided.

This programme is intended for the following range of students:

- Graduates with honours degree and equivalent ideally in a subject related to a component of the course.
- Graduates currently in employment keen to extend their qualifications or to pursue a career change.
- Individuals with other qualifications but who possess considerable relevant experience

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate in Environmental Management for Business

In completing this course, and achieving the associated award, a diligent student should be able to:

ILO 1. Critically analyse environmental issues and contribute to strategic and policy decision making processes in the private, public and NGO sectors at all levels

ILO 2. Develop feasible environmentally and socially responsible strategies and policies based on scientific evidence within the appropriate economic, legal and political frameworks

ILO 3. Communicate and implement strategies within a business environment, through understanding of management decision making, leadership and financial processes.

ILO 4. Monitor and assess organisational practices and the outcomes of policies and strategies through the use of appropriate methods, such as environmental auditing

B. Postgraduate Diploma in Environmental Management for Business

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

ILO 5. Integrate knowledge, understanding and skills from the taught modules in a real-life situation to address problems faced by industrial clients; creating new problem diagnoses, designs, or system insights; and communicating findings in a professional manner in written, oral and visual forms.

C. MSc in Environmental Management for Business

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

ILO 6. Define a research question, develop aim(s) and objectives, select and execute a methodology, analyse data, evaluate findings critically and draw justifiable conclusions, demonstrating self-direction and originality of thought.

ILO 7. To communicate their individual research via a thesis and in an oral presentation in a style suitable for academic and professional audiences.

4. How is the course taught?

Students will be supported in their learning and personal development by:

Teaching and learning methods aim to promote and develop the students as autonomous and reflective learners. This is achieved by providing a structured underpinning knowledge base which the students can test and expand by means of project and case study coursework, individually and in groups. The learning outcomes of the course are pursued by designing lecture and assessment material around practical problems and interaction with the economic and policy sectors of relevance to their studies.
Personal Development Planning is explicitly and implicitly developed during the course, including topics such as communication, time-management, team work, learning strategies and project management.
Additional training and self-study materials are available for students to develop appropriate IT skills, supported by academic staff in a pre-sessional IT course and during the programme.

Technical English and foreign language training is available in a structured programme in addition to the academic course.

In addition the full-time PgDip and MSc students carry out a group project, in which they work with students from other courses, usually on a project sponsored by an external customer to produce a technical report. This enables them to develop their skills of individual and team working, including project management, time management and written and oral communication. Part-time students write a review of available information around a relevant topic including academic literature, presentation of ideas and analysis and the development of conclusions.

MSc students undertake an individual thesis project, such as the written analysis of an environmental case. This develops and tests their ability to plan and carry out a piece of research, their ability to apply theoretical knowledge and their critical thinking. Continual assessment and feedback on performance and personal development is given to students with suggested further study if required

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 8. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. Postgraduate Certificate

The accumulation of 60 credits through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Induction Module	0
Principles of Sustainability	10
Leading Corporate Sustainability	10
ELECTIVE MODULES:	
Choose 4:	
Economic Valuation and Appraisal	10
Sustainability and Environmental Assessment	10
Environmental Policy and Risk Governance	10
Environmental Innovation	10
Strategic Foresight	10
Risk Communication and Perception	10
TOTAL:	60

B. Postgraduate Diploma

The accumulation of 120 credits through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Induction Module	0
Principles of Sustainability	10
Leading Corporate Sustainability	10
Economic Valuation and Appraisal	10
Sustainability and Environmental Assessment	10
Environmental Policy and Risk Governance	10
Environmental Innovation	10

Strategic Foresight Risk Communication and Perception Group Project (Full Time Students)	10 10 40
ELECTIVE MODULES:	
Part Time Students: Group Project OR Dissertation	 40 40
TOTAL:	120

C. MSc

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	**Credits**
COMPULSORY MODULES:	
Induction Module Principles of Sustainability Leading Corporate Sustainability Economic Valuation and Appraisal Sustainability and Environmental Assessment Environmental Policy and Risk Governance Environmental Innovation Strategic Foresight Risk Communication and Perception Group Project (Full Time Students) Thesis	0 10 10 10 10 10 10 10 10 40 80
ELECTIVE MODULES:	
Part Time Students: Group Project OR Dissertation	 40 40
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of ≥50%;
- An average mark of ≥50% across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of

your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee); [3]

- **For Taught Assessments,** the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
  - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of ≥50% across the taught assessments);
  - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
  - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥40 credits, which are not part of the taught assessment average), the pass mark of ≥50% (where they exist);
- **For the thesis,** a mark of ≥50% in order to receive a pass (where it exists).

6. How is the course structured?

Full-time students register for the course in October and are expected to complete the course within 12 calendar months.

Part-time students register for the course in October and are expected to complete the course within 3 years.

The MSc course is taught in three sections: taught modules (40%), group projects (20%), and an individual research project (40%).

The taught programme, typically delivered between October and February, comprises a structured sequence of modules, each containing a series of lectures and other classroom-based teaching, supplemented by practical work. The taught modules are assessed by assignments. Each module is taught over one week, usually followed by an assimilation week largely free of structured teaching to allow time for more independent learning and reflection.

The Group Projects are group-based research program typically undertaken between February and April. The projects are designed to integrate knowledge, understanding and skills from the taught modules in a real-life situation.

The thesis project, typically delivered between May and September, further develops research and project management skills that: provide the ability to think and work in an original way; contribute to knowledge; overcome genuine problems; and communicate through a thesis and oral exam. Each student is allocated a supervisor, who will guide and assess the student work.

Guidance sessions are provided as to what is required from thesis and oral presentation.
Within induction week, students will be introduced to personal development planning and asked to reflect on their transferable skills and to take ownership of their personal development during the course.

[3] Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of <40% (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award (<50%).

7. Course Level Assessment Strategy[4]

The course assessment tasks enable students to demonstrate a full range of skills and attributes that will be required for future "Environmental Management for Business". The modules "Principles of Sustainability" and "Leading Corporate Sustainability" will introduce students to sustainability (and associated challenges), ecosystems, the environment, the circular economy and corporate action. These will be assessed through the completion of a written briefing document for a client (Principle of sustainability) and an individual written assignment. The modules "Economic Valuation and Appraisal" and Sustainability and Environmental Assessmen will introduce students to financial and economic modelling analysis and life cycle assessment. These will be assessed through the completion of an individual written assignment. Under "Environmental Policy and Risk Governance", "Strategic Foresight" and "Risk Communication and Perception", the students will be introduced to the development and appraisal of policy in central government and business, individual and group attitudes towards the perception of risk and a range of methods that can be used to identify, analyse and communicate insights about the future. The modules are assessed through a group video/podcast and associated written critique (Risk Communication and Perception) and written reports. The assignments will be of varying lengths, recognising that writing individual assignments and briefing documents to a short length can be more challenging and can develop different skills relevant to professional practice. The length of each assessment task is clearly stated within the module descriptor. Students will write the briefing document and individual assignment to address the specific award ILOs 1-4. Students will also have the opportunity to develop theory and communication skills, as they are required to give a group presentation under Principles of Sustainability, Leading Corporate Sustainability, Environmental Policy and Risk Governance, Strategic Foresight, Risk Communication and Perception and Environmental Innovation. The ability to work effectively in groups is a highly desirable skill which has translated into ILOs 3. Feedback is given immediately after the group presentation.

All modules are supported by a number of formative tasks including group discussion, case studies and oral presentations. Formative feedback is given verbally within the classroom following discussions or oral feedback provided by the tutor and peers for presentations. The taught components precede the group project. The group project provides the students with the opportunity to gain professional skills expected of the workplace. In addition to technical skill practice, students develop a range of soft skills such as team working, problem solving, communication skills and reflective practice. The students work in small consultancy teams typically on a client sponsored project for a period of 10 weeks. Many teams will be made up of students from different courses giving the students the opportunity of working in an interdisciplinary team. The students are responsible for interpreting the brief, developing a project plan, selecting and implementing a methodology, deriving results, analysing the results and drawing conclusions in alignment with the aims and objectives. All students participate in a peer review activity providing them with the opportunity to reflect on the practices of their colleagues as well as their own. Peer review feedback is provided individually by an independent member of academic staff. A single group report is produced and the project is presented orally at the concluding Exhibition Day, both elements are summatively assessed by independent markers and a group mark is assigned for each element. Individual assessment is derived from supervisor observation and meeting minute actions and an individual reflective report where the students reflect on the development of three soft skill competencies based on objectives that they set for themselves. The team working competency is mandatory as one of the three skills for each student.

The individual research project requires students to further develop problem definition, hypothesis setting, select and execute a methodology, analyse data, and evaluate findings and draw appropriate conclusions in the context of research questions relevant to the course followed by a student. The student is required to communicate their findings successfully via a thesis, written in the style of a scientific paper and an oral presentation based around a poster. The projects are designed to integrate knowledge, the taught modules, and apply understanding and skills from the group project, to deliver a high quality written thesis

[4] Guidance to aid colleagues writing or updating a course-level assessment strategy for inclusion in the Course Specification can be found as Appendix K in either the Senate Handbook on Setting up a New Taught Course or the Senate Handbook on Managing Taught Courses https://intranet.cranfield.ac.uk/EducationServices/Pages/SenateHandbooksA-Z.aspx

and oral presentation. The individual research project/thesis is typically delivered through collaboration with an industrial sponsor, or it may be an ‘internal’ project reflecting the research interests of the School.

Course modules – all Occ A unless specified

The following modules outline all parts of the programme leading to **MSc.** Other awards associated with the course include some or all of these modules.

Module Number	Module code	Title	Module Leader	Contact hours[5]	Total hours delivered by Visiting Lecturers [6]	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[7] - 40% or 50%	Type of Assessment	Weighting within module[8] (%) of Independent assessments	Weighting within module of multi-part assessments [9](100%)	Type of Assessment	Weighting of individual elements of multi-part assessment[10]	Assessment Submission and/or exam date[11]	Assessment / Exam Retake date
1	I-ENV-INWK	Induction	Theresa Mercer	33		0	Y		02/10/23	06/10/23	N/A	AO	N/A				N/A	N/A
2	I-EMB-A1122	Principles of Sustainability	Paul Burgess	26		10	Y		09/10/23	20/10/23	40	ICW	100				FT 21/10/23 PT 04/11/23	05/24
3	I-EEM-A1184	Economic Valuation and Appraisal	Anil Graves	27		10	N		23/10/23	03/11/23	40	ICW	100				FT 04/11/23 PT 18/11/23	05/24
4	I-ERM-A2014	Risk Communicatio	Simon Jude	25		10	Y		06/11/23	17/11/23	40	ICW	70				FT 18/11/23 PT 02/12/23	05/24

[5] Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice
[6] Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)
[7] A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.
[8] For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education
[9] For **multi-part assessments** please record the overall weighting of module which should be 100%. Multipart assessments should only be included in courses where there is a clear androgogical reason and where each element forms part of a continuous learning and assessment experience for students.
[10] Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate*).* If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.
[11] Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours[5]	Total hours delivered by Visiting Lecturers[6]	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[7] - 40% or 50%	Type of Assessment	Weighting within module[8] (%) of Independent assessments	Weighting within module of multi-part assessments [9](100%)	Type of Assessment	Weighting of individual elements of multi-part assessment[10]	Assessment Submission and/or exam date[11]	Assessment / Exam Retake date
		n and Perception										GPRES	30				FT & PT 10/11/23	
5	I-ERM-A2006	Environmental Policy and Risk Governance	David Rose	30		10	Y		20/11/23	01/12/23	40	ICW	100				FT 02/12/23 PT 06/01/24	05/24
6	M-T/LCS Occ C	Leading Corporate Sustainability	Nameta Shete	20		10	Y		04/12/23	15/12/23	40	ICW	100				FT & PT 06/01/24	05/24
7	N-ACE-SEA	Sustainability and Environmental Assessment	Gill Drew	25		10	Y		08/01/24	19/01/24	40	ICW	100				FT 20/01/24 PT 03/02/24	05/24
8	I-EMB-A1128	Environmental Innovation	Jim Harris	25		10	N		22/01/24	02/02/24	40	ICW	100				FT 03/02/24 PT 17/02/24	05/24
9	I-EMB-A1005	Strategic Foresight	Kenisha Garnett	30		10	Y		05/02/24	16/02/24	40	ICW	100				FT 17/02/24 PT 02/03/24	05/24
10	I-SWEE-GRPP	Group Project	Jitka MacAdam	16		40	Y		26/02/24	03/05/24	50 50 50	GCW GPRES ICW	64 16 10				26/04/24 23/04/24 03/05/24	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours[5]	Total hours delivered by Visiting Lecturers[6]	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[7] - 40% or 50%	Type of Assessment	Weighting within module[8] (%) of Independent assessments	Weighting within module of multi-part assessments [9](100%)	Type of Assessment	Weighting of individual elements of multi-part assessment[10]	Assessment Submission and/or exam date[11]	Assessment / Exam Retake date
											50	RP	10				04/05/24	
11	I-SWEE-DISS	Dissertation (part time students)	Jitka MacAdam	10		40	Y		26/02/24	20/09/24	50	IPROJ IPRES	80 20				20/09/24 w/c 23/09/24	SEPT 25
12	I-SWEE-THES	Thesis Project	Jitka MacAdam	20		80	Y		07/05/24	06/09/24	50 50	THESIS OR	90 10				02/09/24 27/08/24 to 04/09/24	SEPT 25

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Please list all modules that are used by another existing course.

Module code	**Module title**	**Course that owns the module**	**Other course(s)/ programme(s) that use the module**
I-ENV-INWK	Induction week	Environmental Engineering	• Environmental Management for Business • Geographical Information Management • Global Environmental Change
M-T/LCS Occ C	Leading Corporate Sustainability	Food Systems and Management SWEE	• Environmental Management for Business • Global Environmental Change
N-ACE-SEA	Sustainability and Environmental Assessment	Renewable Energy (Management Route).	• EngD Sustainable Materials and Manufacturing • Future Food Sustainability • Global Environmental Change • Environmental Management for Business • Environmental Engineering (Jiangsu) • MSc Sustainability •
I-EMB-A1122	Principles of Sustainability	Environmental Management for Business	• Future Food Sustainability • EngD Sustainable Materials and Manufacturing • Sustainability Level 7 Apprenticeship
I-ERM-A2006	Environmental Policy and Risk Governance	Environmental Management for Business	• Global Environmental Change
I-ERM-A2014	Risk Communication and Perception	Environmental Management for Business	• Global Environmental Change • Sustainability Level 7 Apprenticeship
I-EMB-A1005	Strategic Foresight	Environmental Management for Business	• Future Food Sustainability • Engineering Management (Jiangsu)
I-SWEE-GRPP	Group Project	Advanced Water Management	• All SWEE courses
I-SWEE-DISS	Dissertation (part time students)	Advanced Water Management	• All SWEE courses
I-SWEE-THES	Thesis Project	Advanced Water Management	• All SWEE courses

8. How are the ILOs assessed?

The following assessment types are utilised:

The course is assessed as three elements:

- The taught modules (40%) are assessed by in-module assessment, including coursework, which focuses on application of the principles studied, and group presentations, which support underpinning knowledge.
- Group projects (20%) are assessed by means of a written group report and presentations;
- The research project (40%), is assessed by a thesis and an oral examination

This approach has been adopted because:

The use of coursework is entirely appropriate and involves a mix of individual and group working as well as oral and poster presentations. Furthermore a number of the assignments are based on practical aspects of the modules.

Assessment and ILO Mapping

A. Postgraduate Certificate

Award ILOs / Module No.	ILO 1.	ILO 2.	ILO 3.	ILO 4.
2	ICW			
3	ICW	ICW		
4			ICW	
5	ICW		ICW	
6	ICW			ICW
7	ICW	ICW		ICW
8		ICW	ICW	
9			ICW	ICW

B. Postgraduate Diploma

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs / Module No.	ILO 5.
10	GPROJ ICW
11	IPROJ IPRES

C. MSc

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs / Module No.	ILO 6.	ILO 7.
12	THESIS/ OR	THESIS/ OR

CROSS-MODULAR ASSESSMENT

Title	Modules Covered	Assessment	
		Type	Weight (%)

9. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who provides authoritative guidance on policy and procedure to the Panel. Proposals are reviewed in line with the UK Quality Code for Higher Education. New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guiding principles to meet the Expectations and Core Practices of the UK Quality Code for Higher Education. External examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the UK Quality Code for Higher Education. The delivery of new partnership provision is ultimately approved by the Universities Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

10. What opportunities are graduates likely to have on completing the course?

Successful students will have a good understanding of key environmental issues, sustainable development, environmental policy, governance and legislation, and basic business processes. This will provide them with the skills they need to follow varied careers, including environment/sustainability managers in business, environmental consultancy, environmental protection agencies, environmental policy formation and environmental NGOs.

The international nature of the course means that career opportunities are not restricted to the UK. Cranfield graduates develop careers around the world.

Some recent employers include UK Environment Agency, Golder Associates, WRG, Shanks, ERM, Environmental KIN, Enviros, Resource Recovery Forum, VR Group (Helsinki), Bouygues Construction, Honeywell, Virgin Media, Yorkshire Water, Caterpillar and National Energy Foundation. Job titles after graduation include Sustainability Manager, Environmental Manager, HSEQ-coordinator, Business Consultant, Risk Analyst, Product Stewardship Engineer and Highway Development Control Officer.

COURSE SPECIFICATION

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

Date of first publication/latest revision:	September 2020/ June 2024

1. What is the course?

Course information

Course Title	Executive Logistics & Supply Chain Management
Course code	MSOELPTC, PDOELPTC, PCOELPTC,
Academic Year	2023/2024
Valid entry routes	MSc, PGDip, PGCert
Additional exit routes	PgCert, PgDip
Mode of delivery	Part-time live-online and face-to-face Summer School
Location(s)[1] of Study	Cranfield University
School(s)	School of Management
Theme	Leadership and Management
Centre	Logistics, Procurement and Supply Chain Management (LSCM)
Course Director	Dr Ismail Abushaikha
Awarding Body	Cranfield University
Is this an AP Contract course?[2]	No
Is this course offered as a Cranfield Mastership?	No
Apprenticeship Standard the course is mapped to	N/A
Is the Degree apprenticeship integrated or non-integrated?	N/A
Is the Mastership offered as an open and/or closed course?	Open
Teaching Institution	Cranfield University

[1] If any part of this course is delivered at another site, please note which one(s) here
[2] AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Admissions body	Cranfield University
Entry requirements	Standard University entry requirements
UK Qualifications Framework Level	QAA FHEQ Level 7 (Masters)
Benchmark Statement(s)	N/A
Registration Period(s) available	Part-time MSc – up to 3 years
Course Start Month(s)	February and October (Face-to-face delivery for Apprenticeship and non-Apprenticeship Routes)

Institutions delivering the course

This course is delivered by Logistics, Procurement and Supply Chain Management, at the School of Management, where the research interests include:

Logistics, supply chain management and marketing.

Cranfield University interacts with the following institutions and in the following ways:

- students undertake their individual thesis project within their own organisation or field of business, which builds further contacts and opportunities for collaboration with those organisations
- the course contains a number of talks by external speakers from companies such as Accenture, Gartner Research, or from partner academic institutions
-
- one of the two external examiners for the course is always from the non-academic sector, the other being an academic.
- the course has an Industrial Advisory Board

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

The MSc in Executive Logistics and Supply Chain Management is accredited formally by The Chartered Institute of Logistics & Transport until 2023 and The Chartered Institute of Purchasing and Supply until August 2023, and European Logistics Association until August 2023.

2. What are the aims of the course?

Cranfield University offers this course in order to fulfil a market demand for highly capable graduates in the field of Logistics, Procurement and Supply Chain Management. The course further aims to offer personal and specialist skills development for candidates with extensive industrial experience. These objectives are addressed through the aims of the course which are to provide students with:

- an overall appreciation of logistics and supply chain management and their importance to modern business
- appropriate technical knowledge in the key areas of Logistics and Supply Chain Management
- an understanding of the analytical and managerial skills that will enable them to apply this knowledge within a business environment
- an understanding of the need to manage and plan supply chains within an overall business environment in an integrated and co-ordinated manner

This programme is intended for the following range of students:

- candidates with a minimum of three years business or organisational experience in a supply chain-related role;
- candidates with a similar level of experience in a non-supply chain area who are intending to move into the supply chain field, or have recently had a change in career track

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate

In completing this course, and achieving the associated award, a diligent student should be able to:

ILO 1. Demonstrate and analyse a systematic knowledge of supply chain management in general and critical awareness of current supply problems and new thinking at the forefront of the discipline.

ILO 2. Appraise and apply appropriate techniques to address specific challenges in supply chain management

B. Postgraduate Diploma

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

ILO 3. Value a comprehensive and critical knowledge of logistics and supply chain components,

ILO 4. Investigate and solve advanced and complex real-life supply chain problems systematically and creatively using a range of quantitative techniques, analytical tools and supply chain design methodologies.

ILO 5. Design and organise supply chains within an overall business environment in an integrated and coordinated manner

ILO 6. Compare, contrast, and select appropriate supply chain management frameworks, theories, and techniques, and contextualise them for a variety of real-life situations.

ILO 7. Evaluate and develop logistics and supply chain frameworks to address cultural, organisational and sustainability issues.

C. MSc

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

ILO 8. Undertake independent and original research on a relevant supply chain subject, demonstrating the ability to design, plan, manage and execute an industrial or research based project within a specified time scale.

ILO 9. Produce a high quality thesis, based on self-directed, creative research including critical literature review, justified research method(s), valid data gathering, analysis and interpretation, and report writing

4. How is the course taught?

Students will be supported in their learning and personal development by:

- Lectures by the Cranfield University faculty members and external speakers from industry

- Tutorial support throughout the course, including regular meeting with learning team tutor.
- Extensive use is made of the course VLE as a means of delivering material to support and augment classroom learning.

Note: 10 (out of 12) modules of this intake are delivered online (through live lectures + online supported material. Module 5 and 9 will be delivered on campus during summer 2024 (summer week of the course).

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 8. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

Executive Logistics & Supply Chain Management

A. Postgraduate Certificate

The accumulation of 60 credits through the assessment of taught modules (note: "Supply Chain Strategy and Sustainability" module is a compulsory module for Postgraduate Certificate) as detailed below:

Description	Credits
COMPULSORY MODULES:	
Module 0 Module 1 Five modules from 2-12	 10 50
ELECTIVE MODULES:	
TOTAL:	60

B. Postgraduate Diploma

The accumulation of 120 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Module 0 Modules 1-12	120
ELECTIVE MODULES:	
TOTAL:	120

C. MSc

The accumulation of 120 credits through the assessment of taught modules and, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	Credits
COMPULSORY MODULES:	

Module 0 1-12 13 14	0 120 0 80
ELECTIVE MODULES:	
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists, and the student meets the requirements of that lower award.

Pass Criteria
The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of ≥50%;
- An average mark of ≥50% across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee); [3]
- **For Taught Assessments,** the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
  - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of ≥50% across the taught assessments);
  - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
  - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥40 credits, which are not part of the taught assessment average), the pass mark of ≥50% (where they exist);
- **For the thesis,** a mark of ≥50% in order to receive a pass (where it exists).

6. How is the course structured?

Part-time students register for the course in February and are expected to complete the course within 2.5 years.

[3] Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of <40% (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award (<50%).

7. Course Level Assessment Strategy[4]

The aim is to provide a varied, stimulating and experiential learning environment. All taught modules consist of formal lecturers, in-class case discussions, group and self-study. Group project work, reflective practice and class exercises are used to develop problem solving skills.

The course further aims to offer personal and specialist skills development for candidates with industrial experience.

The assessment strategy of this course is challenging and diverse and enables students to demonstrate a full range of skills and attributes.

Summative assessment will include a range of assessment types including the preparation of individual and group coursework and presentation, and individual written exams.

This approach has been adopted in order to ensure that students demonstrate their understanding through a wide range of learning techniques but are not disadvantaged through any one approach.

Written coursework will be of varying lengths, recognising that writing coursework to a short length can be more challenging for some and can develop different skills relevant to professional practice. The length of each assessment task is usually stated within the module descriptor. Students then have opportunities to develop their communication and group working skills, as they are required to give group presentations. Feedback for all assessments is given in a timely fashion, dependent on the type of assessment, but always within 20 working days.

Many modules are supported by a number of formative tasks including group discussion, case studies, oral presentations. Formative feedback will be provided through in-class discussion on the conceptual material introduced during each session.

Formative Feedback
The taught components precede the research project, so assessment can be used to develop skills required for the individual research project. Students are generally expected to be more self-directed in their learning during this research project and guidance will be provided through the Evidence-Based Management module and meetings with their thesis supervisor.

[4] Guidance to aid colleagues writing or updating a course-level assessment strategy for inclusion in the Course Specification can be found as Appendix K in either the Senate Handbook on Setting up a New Taught Course or the Senate Handbook on Managing Taught Courses https://intranet.cranfield.ac.uk/EducationServices/Pages/SenateHandbooksA-Z.aspx

Course modules ELSCM (February)

The following modules outline all parts of the programme leading to **MSc.** Other awards associated with the course include some or all of these modules.

Module Number		Module code	Title	Module Leader	Contact hours[5]	Total hours delivered by Visiting[6]	Credits	Is the module shared? Y/N	Calendar			Assessment							
													Independent Assessment		Multi-part Assessment			Submission dates	
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[7] - 40% or	Type of Assessment	Weighting within module[8] (%) of Independent	Weighting within module of multi-part assessments[9] (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment[10]	Assessment Submission and/or exam date[11]	Assessment / Exam Retake date
0		MML-IND	SLA+ MSc Induction	Dr Ismail Abushaikha	4		0	Y	26/02/24	26/02/24	26/02/24	N/A	AO	N/A				N/A	
1		M-L/ SCSS Occ E23	Supply Chain Strategy and Sustainability	Dr Heather Skipworth	16		10	Y	05/03/24	27/03/24	27/03/24	40	ICW	100				26/05/24	

[5] Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice
[6] Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)
[7] A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.
[8] For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education
[9] For **multi-part assessments** please record the overall weighting of module which should be 100%. Multipart assessments should only be included in courses where there is a clear androgogical reason and where each element forms part of a continuous learning and assessment experience for students.
[10] Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate*)*. If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.
[11] Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination;
– Thesis; MULTI – Multi-part Assessment

Module Number		Module code	Title	Module Leader	Contact hours[5]	Total hours delivered by Visiting	Credits	Is the module shared? Y/N	Calendar			Assessment							
													Independent Assessment		Multi-part Assessment			Submission dates	
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[7] - 40% or	Type of Assessment	Weighting within module[8] (%) of Independent	Weighting within module of multi-part assessments [9](100%)	Type of Assessment	Weighting of individual elements of multi-part assessment[10]	Assessment Submission and/or exam date[11]	Assessment / Exam Retake date
2		M-L/ PSP Occ E24	Principles of Strategic Procurement	Dr Farooq Habib	16		10	Y	04/03/25	04/03/25	26/03/25	40	ICW	100				27/05/25	
3		MXL/ AFSC Occ E24	Accounting and Finance for Supply Chain Management	Dr Matthias Nnadi	16		10	N	05/11/24	05/11/24	27/11/24	40	EX	100				30/01/25	
4		M-L/ ATS Occ L23	Analytical Techniques for Supply Chain Management	Dr Emel Aktas	16		10	Y	02/04/24	02/04/24	24/04/24	40	ICW	100				11/07/24	
5		M-L/ FRT Occ L23	Freight Transport	Dr Yannis Koliousis	16		10	Y	01/07/24	01/07/24	05/07/24	40	ICW	100				01/08/24	
6		M-L/ IOM Occ E24	Inventory and Operations Management	Prof Ying Xie	16		10	Y	03/06/25	03/06/25	25/06/25	40	GCW	100				01/09/25	
7		M-L/ ISB Occ E25	Information Systems and e-Business	Dr Abhi Ghadge	16		10	Y	02/09/25	02/09/25	24/09/25	40	GCW	100				05/12/25	
8		M-L/ PMI Occ E23	Project Management Introduction	Dr Chantal Cantarelli	20		10	Y	01/06/24	01/06/24	14/06/24	40	GCW	100				24/07/24	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination;
– Thesis; MULTI – Multi-part Assessment

Module Number		Module code	Title	Module Leader	Contact hours[5]	Total hours delivered by Visiting	Credits	Is the module shared? Y/N	Calendar			Assessment							
													Independent Assessment		Multi-part Assessment			Submission dates	
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[7] - 40% or	Type of Assessment	Weighting within module[8] (%) of Independent	Weighting within module of multi-part assessments [9](100%)	Type of Assessment	Weighting of individual elements of multi-part assessment[10]	Assessment Submission and/or exam date[11]	Assessment / Exam Retake date
9		M-L/ PND Occ L23	Physical Network Design	Dr Nicky Yates	16		10	Y	01/07/24	01/07/24	04/07/24	40	ICW	100				04/09/24	
10		M-L/ WHS Occ E24	Warehousing	Dr Hendrik Reefke	16		10	Y	06/05/25	06/05/25	28/05/25	40	ICW	100				26/06/25	
11		M-M/ STG Occ E24	Strategic Management	Dr Mikko Arevuo	16		10	Y	07/01/25	07/01/25	29/01/25	40	GCW	100				25/03/25	
12		MXL/ AOB Occ E24	Applied Organisational Behaviour:	Dr Chia-Yu Kou-Barrett	16		10	N	03/09/24	03/09/24	25/09/24	40	ICW	100				06/11/24	
13		M-T/ EBM Occ E25	Evidence Based Management	Dr Joshua Haist	16		0	Y	24/11/25	24/11/25	25/11/25	N/A	AO	N/A				N/A	
14		MXL/ THS Occ E25	Thesis	Various	0		80	N	25/11/25	25/11/25	26/05/26	50	Thesis	100				26/05/26	NON-APP

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination;
– Thesis; MULTI – Multi-part Assessment

Please list all modules that are used by another existing course.

Module code	Module title	Course that owns the module	Other course(s)/ programme(s) that use the module
M-L/SCSS	Supply Chain Strategy and Sustainability	FT MSc LSCM	PSCM; ELSCM
M-L/PSP	Principles of Strategic Procurement	FT MSc LSCM	PSCM; ELSCM
M-L/ATS	Analytical Techniques for Supply Chain Management	FT MSc LSCM	PSCM; ELSCM
M-L/FRT	Freight Transport	FT MSc LSCM	PSCM; ELSCM
M-L/IOM	Inventory and Operations Management	FT MSc LSCM	PSCM; ELSCM
M-L/ISB	Information Systems and e-Business	FT MSc LSCM	PSCM; ELSCM
M-L/PMI	Project Management Introduction	FT MSc LSCM	PSCM; ELSCM
M-L/PND	Physical Network Design	FT MSc LSCM	ELSCM
M-L/WHS	Warehousing	FT MSc LSCM	ELSCM
M-M/STG	Strategic Management	MBA	EMBA, ELSCM
M-T/EBM	Evidence Based Management	MSc Management	MCS, MENT, ELSCM, MML

8. How are the ILOs assessed?

The following assessment types are utilised:

The course uses a range of assessment types. Students can expect to have two written examinations, fourteen pieces of written assessment, plus an individual thesis for the MSc.

This approach has been adopted in order to ensure that:

students demonstrate their understanding through a wide range of learning techniques, but are not disadvantaged through any one approach.

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

(Module numbers should correspond with those used in the Course module table above.)

	Executive MSc in Logistics and Supply Chain Management (ILO1–9) *Needs 200 credits from all taught modules plus thesis*								
	Postgraduate Diploma (ILO1-7) *Needs 120 credits from taught modules*								
	PgCert (ILO1-2) *Needs 60 credit rom taught modules*								
Award ILOs **Module # /Assessment**	**ILO1**	**ILO2**	**ILO3**	**ILO4**	**ILO5**	**ILO6**	**ILO7**	**ILO8**	**ILO9**
Supply Chain Strategy and Sustainability	ICW	ICW				ICW	ICW		
Freight Transport	ICW	ICW	ICW	ICW	ICW	ICW			
Warehousing	ICW	ICW	ICW	ICW		ICW			
Analytical Techniques for Supply Chain Management	ICW	ICW		ICW		ICW			
Information Systems and E-Business	GCW	GCW			GCW	GCW			
Inventory and Operations Management	GCW	GCW	GCW	GCW	GCW	GCW			
Accounting and Finance	Ex	Ex		Ex					
Principles of Strategic Procurement	ICW	ICW	ICW			ICW	ICW		
Physical Network Design	ICW	ICW		ICW		ICW			
Project Management Introduction		GCW			GCW	GCW	GCW		
Strategic Management		GCW		GCW	GCW	GCW	GCW		
Applied Organisational Behaviour	ICW	ICW			ICW	ICW	ICW		
Evidence Based Management	AO	AO	AO	AO	AO	AO	AO	AO	AO
Thesis	THS	THS	THS	THS	THS	THS	THS	THS	THS

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	**Modules Covered**	**Assessment**	
		Type	Weight (%)
N/A			

9. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who provides authoritative guidance on policy and procedure to the Panel. Proposals are reviewed in line with the UK Quality Code for Higher Education. New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guiding principles to meet the Expectations and Core Practices of the UK Quality Code for Higher Education. External examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the UK Quality Code for Higher Education. The delivery of new partnership provision is ultimately approved by the Universities Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as

a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

10. What opportunities are graduates likely to have on completing the course?

The graduates from the part-time course are likely to be in employment and many maybe sponsored by their employer. However many of these graduates are able to fast-track their careers through the skills and knowledge gained on the course.

Similarly, some graduates choose to use the qualification to move to another employer and there have been many examples of individuals advancing their career by moving into higher-ranked positions in global organizations.

There continues to be a high level of demand for well-qualified Masters graduates in Supply Chain Management and this course is recognised by industry as being at the forefront of meeting that demand.

COURSE SPECIFICATION

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

Date of first publication/latest revision: June 2024

1. What is the course?

Course information

Course Title	Executive Master of Business Administration
Course code	MBEBAPTC, PDEBAPAC
Academic Year	2023/24
Valid entry routes	MBA (Standard Route only) PgDip (Apprenticeship Route only)
Additional exit routes	PgDip, PgCert
Mode of delivery	Part-time
Location(s)[1] of Study	Cranfield University, Grant Thornton premises
School(s)	School of Management
Theme	Leadership and Management
Centre	Centre for Management
Course Director	Dr Yannis Koliousis
Awarding Body	Cranfield University
Is this an AP Contract course?[2]	Defence only
Is this course offered as a Cranfield apprenticeship?	Yes
Apprenticeship Standard the course is mapped to	Senior Leader (Degree) Level 7 Apprenticeship Standard
Is the Degree apprenticeship integrated or non-integrated?	Non-integrated
Is the Apprenticeship offered as an open and/or closed course?	Open
Teaching Institution	Cranfield University

[1] If any part of this course is delivered at another site, please note which one(s) here
[2] AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Admissions body	Cranfield University
Entry requirements	• A minimum of five years' post-qualification work experience. • A good degree and / or professional qualification, or . • Can demonstrate high levels of achievement, exceptional career progression or evidence of leadership potential. International applicants need to provide evidence of English language. The minimum standard is: IELTS – 7, TOEFL – 100, Pearson PTE Academic- 68, Cambridge English Scale – 190, Cambridge English: Advanced – A, Cambridge English: Proficiency – B.
UK Qualifications Framework Level	QAA FHEQ Level 7 (Masters)
Benchmark Statement(s)	Not Applicable
Registration Period(s) available	2 years - Post-graduate Diploma 3 years - EMBA
Course Start Month(s)	September and March

Institutions delivering the course

This course is delivered by the School of Management where the research interests consist of a wide range of management functions.

Teaching and assessment is provided by the School of Management with input on some modules from Grant Thornton.

Cranfield University interacts with the following institutions and in the following ways:

- All students will undertake a group consulting project in an external organisation, presenting findings to senior managers from the organisation involved
- Each module will incorporate input from senior managers/practitioners where appropriate
- Some of the modules require learning teams to visit an organisation to audit their approach
- Some students undertake research and/or project work off campus, within organisations.

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

The Cranfield Management School course is accredited formally by; the Association to Advance Collegiate Schools of Business (AACSB), the Association of MBAs (AMBA) and the European Quality Improvement System (EQUIS).

The course is accredited by the Chartered Management Institute (CMI).

2. <u>What are the aims of the course?</u>

The Cranfield executive MBA has a duration of 28 months and aims to provide a distinctive and collaborative learning experience centred on a process of intense, interactive classroom sessions where the combination of the professional experience of a diverse student cohort and the faculty's direct involvement with global businesses ensures graduates have a deep understanding of contemporary business issues and the capacity to assume active leadership roles. This experience is founded on the integration of four aims:

- To develop a group of influential leaders who will make a significant impact on their organisations and the wider community.

- To deliver a contemporary and comprehensive knowledge of core business functions enabling students to talk knowledgeably to experts in these areas.
- To create a strategic mindset capable of viewing organisations as consisting of functions and groups whose actions must be motivated and aligned to meet objectives.
- To generate the self-awareness and confidence to operate effectively as a member of and/or leader of a team drawn from a variety of cultures, business experience and personalities.
- To create an understanding as to how to develop leadership capabilities in self and others in order to meet the increasing challenge of change.

This programme is intended for the following range of students:

- Experienced professionals who want a "real-world" business education which they can apply directly back to their workplace.
- Self-motivated managers who are keen to improve themselves, enhance their skills, knowledge and abilities, and become more effective leaders.
- Energetic entrepreneurs who want support to start a new business or grow their existing business.

3. What should students expect to achieve in completing the Post-graduate Diploma and EMBA

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Post-graduate Diploma

The intended learning outcomes (ILO's) are achieved within the PgDip, with a focus on the student's current role and leadership position. They enable them to unlock their potential as a senior leader through the attainment of knowledge skills and behaviours that map to the senior leaders L7 standard. The ILO's are further achieved by continuing with the EMBA, but with a focus on unlocking their potential beyond their current role as executive senior leaders. This is achieved in the following ways:

- Through a continued exploration of their leadership capabilities in challenging contexts
- Gaining additional contextualised knowledge, skills and behaviours, with respect to their chosen specialism and / or sector (elective stream)
- Gaining deeper knowledge, skills and behaviours, beyond their current role, through experiential learning.

In completing the PgDip, and achieving the associated award, a diligent student should be able to:

ILO 1. Demonstrate robust yet flexible qualities of leadership and an understanding of a wide range of management techniques.
ILO 2. Exhibit a conceptual understanding of the main functional areas of management and a systematic knowledge of the relevant literature.
ILO 3. Have a thorough understanding of the importance of strategy, cross-function working and managing core business processes.
ILO 4. Identify, analyse and appraise global social, environmental and economic issues and relate how these present both challenges and opportunities to business
ILO 5. Display the capability to identify, analyse and implement appropriate conclusions for complex problems, in the context of uncertainty and change.
ILO 6. Critically evaluate their personal strengths, weaknesses and preferences.
ILO 7. Present confidence in working with others and an ability to argue and present coherently and persuasively influence.
ILO 8. Develop an ability to work with peers in order to create and implement effective strategies.
ILO 9. Deal with challenging individuals and situations effectively.

B. Executive MBA

The Executive MBA continues to the develop student's capabilities in ILO's 1 – 9. In completing the EMBA, and achieving the associated award, a diligent student should further be able to:

ILO 10. Articulate a critical awareness of the global environment within which organisations operate and the cultural, political, managerial and ethical ambiguities and risks that this gives rise to.
ILO 11. Understand how to manage their career development

Students following a prescribed MBA pathway will also be able to contextualise the above ILOs with respect to their chosen specialism and/or sector.

4. How is the course taught?

Students will be supported in their learning and personal development by:

- The programme is delivered through classroom and online (blended) interaction combined with a high proportion of teamwork, group projects and private study.

In addition to the teaching methods outlined above, students will be supported in their learning and personal development by:

- being placed in a diverse leaning team and supervised by a pool of learning team mentors from within the School of Management
- being exposed to a range of psychometric tests and an assessment centre exercise; and
- one-to-one coaching from professionals.

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 8. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours. In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. Post-Graduate Certificate in Business Administration

The accumulation of 60 credits[3] through the assessment of taught modules as detailed below:

Description	**Credits**
COMPULSORY MODULES:	
Any 60 credits from Modules 1 to 11	60
TOTAL:	**60**

B. Post-Graduate Diploma in Business Administration

[3] Senate Regulations require a minimum of 60 learning credits to be accumulated for the Award of PgCert. The number of learning credits for individual courses is set during course validation

The accumulation of 120 credits[4] through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Module 1 Modules 2-11	20 100
TOTAL:	**120**

Students registered on the Post-graduate Diploma leading to the Executive MBA are required to complete the End Point Assessment prior to transferring to the EMBA. Please refer to the Senior Leader Level 7 Degree Apprenticeship in Annex A and KSB mapping document in Annex B for more information.

C. Executive MBA

The accumulation of 220 credits through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Module 1, Modules 2-11 Modules 12- 17	20 100 60
ELECTIVE MODULES:	
30 credits by choosing one of the following pathways: Stream 1 Commercial modules: 18,19, 20 Stream 2 Entrepreneurship modules: 21,22, 23 Stream 3 Finance modules: 24, 25, 26 – not running in 2021-22 10 credits from either module: 31 or 32	30 10
TOTAL:	**220**

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists, and the student meets the requirements of that lower award.

Pass Criteria

In order to achieve your award, you are required to achieve:

Each assessment is awarded a mark out of 100 per cent. Where a module is assessed with more than one assessment e.g., a group project and an examination, marks are awarded separately for each assessment and then weighted together to determine the mark for the module. A student will be deemed to have passed a module if he/she achieves a mark of 50 per cent or more. Each module carries a number of credits which are used as the weightings to calculate an overall weighted average mark for each part of the Programme. Part I and Part II of the Programme are assessed separately and a student will be regarded as having failed either if he/she:

[4] Senate Regulations require a minimum of 120 learning credits to be accumulated for the Award of PgDip. The number of learning credits is set during course validation

(1) achieve an overall weighted average of less than 50 per cent;
or (2) achieve a mark of less than 50 per cent on more than 30 credits
or (3) achieve a mark of less than 30 per cent on more than 10 credits.

These conditions apply separately to Part I and Part II of the Programme.
In any **compulsory** module a mark of less than 40 per cent for the individual assessment – it may be an exam or a project – will result in the module receiving a maximum mark of 49 per cent irrespective of the marks gained in any assessed group work. In short you will be deemed to have failed the module.

Resit Policy
If the mark for Part I indicates failure students will have the opportunity to resit examinations or individual assessments up to a maximum of 30 credits in Part I. If the individual element of the module failed was an examination the resit will be an examination and if it was an individual written project, the student will be required to resubmit a project. However, in both cases the module leader can (with the permission of the Academic Programme Director) change the nature of the resit. The main purpose of resits is to give students who would otherwise fail Part I a final opportunity to pass it but in a manner that does not create an unfair opportunity for students to increase their overall module average. Therefore:

- students will only be allowed to take resits if they are deemed to have failed Part I due to one of the three criteria set above; and
- all resit marks will be capped at 50 per cent; and
- students can only resit an examination once.

In determining whether or not having taken resits a student is deemed to have passed Part I, the highest of the following will stand, subject to a **maximum** mark of 50 per cent:

- the resit exam mark;
- the overall module mark with the resit exam mark substituted for, and given the same weighting as, the **original** individual assessment mark;
- the **original overall module mark**.

6. How is the course structured?

Post-graduate Diploma - Part-time students register for the course in September, January or April and are expected to complete the course within 15 months.

Executive MBA - Part-time students register for the course in September, January or April and are expected to complete the course within 28 months.

The EMBA programme is in two parts. Part I lasts for 15 months and consists of compulsory modules designed to provide students with a contemporary understanding of basic business functions e.g. strategy, accounting & finance, marketing, operations and supply chain. Part II is 13 months duration and here eligible students continue with compulsory modules but gain discretion over their learning by choosing a 30 credit elective stream. Throughout the whole programme i.e. Part I and II, the Developing Leadership theme is emphasised through three compulsory modules dealing with self-awareness, leadership skills and contemporary leadership challenges. In Part II students have an opportunity to join together for the International Business Assignment. During this period students choose a traditional "study tour" consisting of a visit to a business school and companies in a country chosen from a short-list, or field trips where small groups of students work with small companies or charities in a different culture.

7. Course Level Assessment Strategy[5]

[5] Guidance to aid colleagues writing or updating a course-level assessment strategy for inclusion in the Course Specification can be found as Appendix K in either the Senate Handbook on Setting up a New Taught Course or the Senate Handbook on Managing Taught Courses https://intranet.cranfield.ac.uk/EducationServices/Pages/SenateHandbooksA-Z.aspx

The aim of the course is to provide a varied, stimulating and experiential learning environment. All taught modules consist of formal lectures, in-class case discussions, group and self-study. Group project work, reflective practice and class exercises are used to develop problem solving skills. The course further aims to offer personal and specialist skills development for candidates with extensive industrial experience. This approach has been adopted to ensure that students demonstrate their understanding through a wide range of learning techniques, but are not disadvantaged through any one approach.

The assessment strategy of this course is challenging and diverse and enables students to demonstrate a full range of skills and attributes, as described in module and course intended learning outcomes. Summative assessment will include a range of assessment types including the preparation of individual and group reports, presentations and written exams.

Written coursework will be of varying lengths, recognising that writing coursework to a short length can be more challenging for some and can develop different skills relevant to professional practice. The length of each assessment task will usually be stated within the module descriptor. Students then have opportunities to develop their communication and group working skills, as they are required to give group presentations. Feedback for all assessments is given in a timely fashion, dependent on the type of assessment, but always within 20 working days.

Many modules, such as, Economics and Business Strategy, Strategic Operations Management and Programme and Project Management are supported by a number of formative tasks including group discussion, case studies and oral presentations.

The programme has three integrated assessments of 20 credits, to enhance the student learning journey. The consolidated assessment approach supports the examination of a breadth of knowledge and synthesized learning and learning outcomes. Further, by assessing multiple modules in a single assignment provides a deeper examination of theory into practice.

Formative feedback will be provided through in-class discussion on the conceptual material introduced during each session.

Course modules – April 2022 – Occurrence G

The following modules outline all parts of the programme leading to **MBA**. Other awards associated with the course include some or all of these modules.

Module Number		Module code	Title	Module Leader	Contact hours[6]	Total hours delivered by Visiting Lecturer[7]	Credits	Is the module shared? Y/N	Calendar			Assessment							
													Independent Assessment		Multi-part Assessment			Submission dates	
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[8] - 40% or 50%	Type of Assessment	Weighting within module[9] (%) of Independent	Weighting within module of multi-part assessments[10] (%)	Type of Assessment	Weighting of individual elements of multi-part assessment[11]	Assessment Submission and/or exam date[12]	Assessment / Exam Retake date
Part 1 (XY1)																			
0		MXM-IND G21	SOM Induction Module	Dr Ioannis Koliousis	8		0	Y		27/04/22	29/04/22	N/A						AO	
1		MXM/PPF G21	Organisational Behaviour: Personal and Professional Foundations of	Prof Richard Kwiatkowski	32		20	N		28/05/22	06/10/22	50%	IPROJ	100				25/11/22	

[6] Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice
[7] Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)
[8] A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.
[9] For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education
[10] For **multi-part assessments** please record the overall weighting of module which should be 100%. Multipart assessments should only be included in courses where there is a clear androgogical reason and where each element forms part of a continuous learning and assessment experience for students.
[11] Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate*).* If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.
[12] Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number		Module code	Title	Module Leader	Contact hours[6]	Total hours delivered by Visiting Lecturers[7]	Credits	Is the module shared? Y/N	Calendar			Assessment							
													Independent Assessment		Multi-part Assessment			Submission dates	
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[8] - 40% or 50%	Type of Assessment	Weighting within module[9] (%) of Independent	Weighting within module of multi-part assessments[10] (%)	Type of Assessment	Weighting of individual elements of multi-part assessment[11]	Assessment Submission and/or exam date[12]	Assessment / Exam Retake date
			Leadership and Change																
2	NEW	MXM/SMG Occ G22	Strategic Management	Prof Cliff Bowman	16		10	N		03/03/23	27/04/23	50%	Integrated GCW	70				27/05/23	
3	NEW	MXM/RRM Occ G22	Reputational Risk Management	Dr Elmar Kutsch	16		10	N		02/02/23	02/03/23	50%	ICW	30				06/04/23	
4	NEW	MXM/SMKT Occ G22	Strategic Marketing	Dr Dennis Esch	16		10	N		07/10/22	03/11/22	50%	Integrated ICW	100				01/12/22	
5	NEW	MXM/ACFM Occ G22	Accounting and Financial Management	Andy Mack, GT/ Dr Matthias Nnadi	16		10	N		10/09/22	08/10/22	50%							
6	NEW	MXM/OPS Occ G21	Strategic Operations Management	Dr Abdulkader Aoufi	16		10	N		26/05/22	23/06/22	50%	Integrated GCW	100				09/09/22	
7	NEW	MXM/LSUB Occ G21	Leading Sustainable Business	Dr Miying Yang	16		10	N		27/05/22	24/06/22	50%							
8	NEW	MXM/QDA Occ G22	Quantitative Data Analysis	Dr Andy Angus	16		10	N		09/09/22	05/11/22	50%	EX	100				05/01/23	

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													Independent Assessment		Multi-part Assessment			Submission dates	
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[8] - 40% or 50%	Type of Assessment	Weighting within module[9] (%) of Independent	Weighting within module of multi-part assessments[10] (%)	Type of Assessment	Weighting of individual elements of multi-part assessment[11]	Assessment Submission and/or exam date[12]	Assessment / Exam Retake date
9	NEW	MXM/MSI Occ G21	Managing Strategic Innovation	Prof Leon Williams	16		10	N		21/07/22	08/09/22	50%	GCW	100				08/10/22	
10		MXM/ECBS Occ G22	Economics and Business Strategy	Prof Catarina Figueira	16		10	Y		04/11/22	01/12/22	50%	GCW	100				05/01/23	
11	NEW	MXM/GME Occ G22	Global Macroeconomics and Business Environment	Prof Joe Nellis	16		10	N		02/12/22	06/01/22	50%	GCW	100				03/02/23	
Part II (XY2)																			
12		M-M/MPC Occ G23	Challenges for Leaders: Managing People and Change	Mengyi Xu	16		10	Y		21/09/23	22/09/23	50%	EX	100				01/11/2023	
13		MXM/LWI Occ G23	Leading with Impact	Lyn Lanka	16		10	N		18/04/24	17/05/24	50%	ICW	100				03/07/24	
14	NEW	MXM/DIT Occ G23	Disruptive Technologies	Yannis Koliousis	16		10	N		16/11/23	17/11/23	50%	GCW	100				03/01/24	

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Module Number		Module code	Title	Module Leader	Contact hours[6]	Total hours delivered by Visiting Lecturers[7]	Credits	Is the module shared? Y/N	Calendar			Assessment							
													Independent Assessment		Multi-part Assessment			Submission dates	
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[8] - 40% or 50%	Type of Assessment	Weighting within module[9] (%) of Independent	Weighting within module of multi-part assessments[10] (%)	Type of Assessment	Weighting of individual elements of multi-part assessment[11]	Assessment Submission and/or exam date[12]	Assessment / Exam Retake date
15	NEW	MXM/RED Occ G23	Research Evidence and Decision Making	Dr Andy Angus	16		10	N		19/04/24	11/07/24	50%	GCW	100				14/08/23	
16		M-M/NBO Occ G23	Negotiating in Business and Organisations	Dr Javier Marcos	16		10	Y		14/12/23	15/12/23	50%	GPRAC ICW	80 20				15/12/23 07/02/24	
17	NEW	MXM/BRP Occ G22	Business Research Project	Yannis Koliousis	16		10	N		20/07/23	21/10/23	50%	ICW	100				12/06/24	
Specialist stream1: Commercial																			
18		MXM/ORR Occ G23	Organisational Resilience	Dr Elmar Kutsch	16		10	Y		19/01/24	16/03/24	50%	ICW	100				24/04/24	
19		M-M/SCC Occ G23	Strategizing in Challenging Contexts	Prof Andrey Pavlov	16		10	Y		20/01/24	14/03/24	50%	GCW	100				01/05/24	
20		MXM/P2M Occ G23	Programme and Project Management	Stephen Carver	16		10	Y		18/01/24	15/03/24	50%	GCW GPRAC	50 50				09/11/23 (PRE-COURSE) 25/03/24	

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Module Number		Module code	Title	Module Leader	Contact hours[6]	Total hours delivered by Visiting Lecturer[7]	Credits	Is the module shared? Y/N	Calendar			Assessment							
													Independent Assessment		Multi-part Assessment			Submission dates	
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[8] - 40% or 50%	Type of Assessment	Weighting within module[9] (%) of Independent	Weighting within module of multi-part assessments[10] (%)	Type of Assessment	Weighting of individual elements of multi-part assessment[11]	Assessment Submission and/or exam date[12]	Assessment / Exam Retake date
Specialist stream 2: Entrepreneurship																			
21		M-M/LMF Occ G23	Leading and Managing the Family Enterprise	Dr Stephanie Hussels	16		10	Y		15/03/24	16/03/24	50%	GCW	100				15/05/24	
22		M-M/ENT Occ G23	Entrepreneurship and New Venture Creation	Oksana Koryak	16		10	Y		18/01/24	20/01/24	50%	GCW	100				20/03/24	
23		M-M/ESB Occ G23	Entrepreneurial Finance	Dr Stephanie Hussels	16		10	Y		19/01/24	14/03/24	50%	GCW	100				24/04/24	
Specialist stream 3: Finance - Not running																			
24		M-M/MMA	Managing International Mergers and Acquisitions	Dr Paul Raspin	16		10	Y	Not running			N/A	GCW	100					
25		M-M/CFS	Corporate Financial Strategy	Prof Khaled Soufani	16		10	Y	Not running				EX	100					

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Module Number		Module code	Title	Module Leader	Contact hours[6]	Total hours delivered by Visiting Lecturers[7]	Credits	Is the module shared? Y/N	Calendar			Assessment							
													Independent Assessment		Multi-part Assessment			Submission dates	
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[8] - 40% or 50%	Type of Assessment	Weighting within module[9] (%) of Independent	Weighting within module of multi-part assessments[10] (%)	Type of Assessment	Weighting of individual elements of multi-part assessment[11]	Assessment Submission and/or exam date[12]	Assessment / Exam Retake date
26		MXM/ CFTR	Corporate Finance Transactions	Prof Yacine Belghitar/Prof Khaled Soufani	16		10	N	**Not running**				ICW GCW	30 70					
Specialist stream 4: Defence Export - Not running																			
27		R-DMR-LEPDSF	Legal Ethical and Political Defence Security Frameworks	Dr Anicee Van Engeland	16		10	Y	Not running for April 22			50%	ICW	100					
28		R-DMR-DSM	Defence and Security Marketing	Richard Fisher	16		10	Y	Not running for April 22			50%	ICW	100					
29		R-DMR-DSO	Defence and Security Offset	Prof Ron Matthews	16		10	Y	Not running for April 22			50%	ICW	100					
30		R-DMR-STCC	Strategic Trade Controls and Compliance	Peter Jolliffe	16		10	Y	Not running for April			50%	ICW	100					
Electives																			

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number		Module code	Title	Module Leader	Contact hours[6]	Total hours delivered by Visiting Lecturers[7]	Credits	Is the module shared? Y/N	Calendar			Assessment							
													Independent Assessment		Multi-part Assessment			Submission dates	
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[8] - 40% or 50%	Type of Assessment	Weighting within module[9] (%) of Independent	Weighting within module of multi-part assessments[10] (%)	Type of Assessment	Weighting of individual elements of multi-part assessment[11]	Assessment Submission and/or exam date[12]	Assessment / Exam Retake date
31		M-M/IBA Occ G23	International Business Assignment	Prof Emma Parry	20		10	Y		15/02/24	17/02/24	50%	ICW GCW	20 80				TBC	
32		M-M/IBE Occ G23	International Business Environment	Yannis Koliousis	20		10	Y		22/06/24	13/07/24	50%	GCW	100				29/08/24	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Please list all modules that are used by another existing course.

	Module code	**Module title**	**Course that owns the module**	**Other course(s)/ programme(s) that use the module**
10	MXM/ECBS	Economics and Business Strategy	Executive Master of Business Administration	Business and Strategic Leadership
12	M-M/MPC	Challenges for Leaders: Managing People and Change	Master of Business Administration	Executive Master of Business Administration
16	M-M/NBO	Negotiating in Business and Organisations	Master of Business Administration	Executive Master of Business Administration
18	MXM/ORR	Organisational Resilience	Executive Master of Business Administration	Master of Business Administration
19	M-M/SCC	Strategizing in Challenging Contexts	Master of Business Administration	Executive Master of Business Administration
20	MXM/P2M	Programme and Project Management	Executive Master of Business Administration	Business and Strategic Leadership; Retail and Digital Banking
21	M-M/LMF	Leading and Managing the Family Enterprise	Master of Business Administration	Executive Master of Business Administration
22	M-M/ENT	Entrepreneurship and New Venture Creation	Master of Business Administration	Executive Master of Business Administration
23	M-M/ESB	Entrepreneurial Finance	Master of Business Administration	Executive Master of Business Administration
24	M-M/MMA	Managing International Mergers and Acquisitions	Master of Business Administration	Executive Master of Business Administration
25	M-M/CFS	Corporate Financial Strategy	Master of Business Administration	Executive Master of Business Administration
27	R-DMR-LEPDSF	Legal Ethical and Political Defence Security Frameworks	Postgraduate Certificate Defence and Security Export	Executive Master of Business Administration (Defence Export) Defence and Security Programme
28	R-DMR-DSM	Defence and Security Marketing	Postgraduate Certificate Defence and Security Export	Executive Master of Business Administration (Defence Export)
29	R-DMR-DSO	Defence and Security Offset	Postgraduate Certificate Defence and Security Export	Executive Master of Business Administration (Defence Export) Defence and Security Programme
30	R-DMR-STCC	Strategic Trade Controls and Compliance	Postgraduate Certificate Defence and Security Export	Executive Master of Business Administration (Defence Export)
31	M-M/IBA	International Business Assignment	Master of Business Administration	Executive Master of Business Administration
32	M-M/IBE	International Business Environment	Master of Business Administration	Executive Master of Business Administration

8. How are the ILOs assessed?

The programme uses a range of assessment types. In addition to closed book and open book written examinations, students undertake a wide range of projects. A more unusual type of assessment is the simulation. Here students – again working in teams – might be required to build a warehouse or an electrical product – within a limited period of time, where information may be given and/or changed at intervals. Many assessments allow the theoretical learning to be applied within the student's workplace.

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

(Module numbers correspond with those used in the Course module table above.)

A. Post-graduate Diploma in Business Administration

Award ILOs Module No.	ILO1.	ILO2.	ILO3.	ILO4.	ILO5.	ILO6.	ILO7.	ILO8.	ILO9.	ILO10.	ILO11.
01	IPROJ				IPROJ	IPROJ	IPROJ	IPROJ	IPROJ	IPROJ	
02	Integrated GCW ICW		Integrated GCW ICW	Integrated GCW ICW	Integrated GCW ICW		Integrated GCW ICW	Integrated GCW ICW	Integrated GCW ICW	Integrated GCW ICW	
03											
04	Integrated ICW	Integrated ICW	Integrated ICW	Integrated ICW	Integrated ICW			Integrated ICW	Integrated ICW	Integrated ICW	
05											
06		Integrated GCW	Integrated GCW	Integrated GCW	Integrated GCW		Integrated GCW	Integrated GCW		Integrated GCW	Integrated GCW
07											
08					EX						
09		GCW	GCW	GCW	GCW						
10		GCW	GCW	GCW	GCW				GCW	GCW	
11				GCW	GCW		GCW			GCW	

B. Executive MBA

Award ILOs Module No.	ILO1.	ILO2.	ILO3.	ILO4.	ILO5.	ILO6.	ILO7.	ILO8.	ILO9.	ILO10.	ILO11.
01	IPROJ				IPROJ	IPROJ	IPROJ	IPROJ	IPROJ	IPROJ	
02	Integrated GCW ICW		Integrated GCW ICW	Integrated GCW ICW	Integrated GCW ICW		Integrated GCW ICW	Integrated GCW ICW	Integrated GCW ICW	Integrated GCW ICW	
03											
04	Integrated ICW	Integrated ICW	Integrated ICW	Integrated ICW	Integrated ICW			Integrated ICW	Integrated ICW	Integrated ICW	
05											
06		Integrated GCW	Integrated GCW	Integrated GCW	Integrated GCW		Integrated GCW	Integrated GCW		Integrated GCW	Integrated GCW
07											
08					EX						
09		GCW	GCW	GCW	GCW						

Award ILOs / Module No.	ILO1.	ILO2.	ILO3.	ILO4.	ILO5.	ILO6.	ILO7.	ILO8.	ILO9.	ILO10.	ILO11.
10		GCW	GCW	GCW	GCW				GCW	GCW	
11				GCW	GCW		GCW			GCW	
12	EX					EX		EX			EX
13	ICW							ICW			ICW
14			GCW	GCW	GCW					GCW	
15					GCW		GCW				
16	ICW GPRAC	ICW GPRAC			ICW GPRAC						ICW GPRAC
17		ICW	ICW		ICW		ICW	ICW		ICW	
18		ICW	ICW		ICW		ICW			ICW	
19			GCW		GCW		GCW	GCW		GCW	
20	GCW GPRAC	GCW GPRAC			GCW GPRAC		GCW GPRAC	GCW GPRAC		GCW GPRAC	
21	GCW		GCW		GCW			GCW	GCW	GCW	
22	GCW	GCW	GCW				GCW	GCW		GCW	GCW
23					GCW		GCW	GCW		GCW	GCW
24	GCW				GCW		GCW	GCW			
25	EX		EX		EX						
26		ICW GCW	ICW GCW		ICW GCW		ICW GCW	ICW GCW		ICW GCW	
31			ICW GCW				ICW GCW	ICW GCW		ICW GCW	
32			GCW				GCW	GCW		GCW	

C. MBA (Defence export)

Award ILOs / Module No.	ILO1.	ILO2.	ILO3.	ILO4.	ILO5.	ILO6.	ILO7.	ILO8.	ILO9.	ILO10.	ILO11.
27					ICW				ICW	ICW	
28		ICW	ICW		ICW		ICW	ICW			
29					ICW		ICW			ICW	
30		ICW	ICW		ICW		ICW			ICW	

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	Modules Covered	Assessment	
		Type	Weight (%)
Integrated Assessment	Strategic Management; Reputational Risk Management	GCW ICW	70 30

Integrated Assessment	Strategic Marketing; Accounting and Financial Management	ICW	100
Integrated Assessment	Strategic Operations Management; Leading Sustainable Business	GCW	100

9. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who provides authoritative guidance on policy and procedure to the Panel. Proposals are reviewed in line with the UK Quality Code for Higher Education. New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guiding principles to meet the Expectations and Core Practices of the UK Quality Code for Higher Education. External examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the UK Quality Code for Higher Education. The delivery of new partnership provision is ultimately approved by the Universities Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

10. What opportunities are graduates likely to have on completing the course?

The list of opportunities available to our MBAs after graduating is extremely wide. Drawing on recent surveys of our graduates the most popular functions were as follows:

General Management
Engineering and R & D Management
Consultancy
Business Development
Strategy
Sales/Marketing
Finance/Accounting
Operations
IT Project Management

In addition a small but growing number of students set-up their own businesses, though this number increases after two to three years post-graduation.

COURSE SPECIFICATION

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

Date of first publication/latest revision: ~~11/07/22~~June 2024

1. What is the course?

Course information

Course Title	Expeditionary Warfare Systems Engineering and Technology
Course code	MSEWSPTR, PDEWSPTR, PCEWSPTR , SPEWSPTR
Academic Year	2023/2024
Valid entry routes	MSc, PgDip, PgCert, Accredited Short Courses
Additional exit routes	N/A
Mode of delivery	Part-time
Location(s)[1] of Study	NSWC Crane, USA
School(s)	Cranfield Defence and Security
Theme	Defence and Security
Centre	Centre for Defence Engineering
Course Director	Ajay Kumar
Awarding Body	Cranfield University
Is this an AP Contract course?[2]	No
Is this course offered as a Cranfield Mastership?	No
Apprenticeship Standard the course is mapped to	No
Is the Degree apprenticeship integrated or non-integrated?	No
Is the Mastership offered as an open and/or closed course?	No

[1] If any part of this course is delivered at another site, please note which one(s) here
[2] AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Teaching Institution	Cranfield University
Admissions body	Cranfield University
Entry requirements	Standard University Entry Requirements
UK Qualifications Framework Level	QAA FHEQ level 7 (Masters)
Benchmark Statement(s)	N/A
Registration Period(s) available	Maximum of 5 years for MSc, 4 years for PgDip and 3 years for PgCert
Course Start Month(s)	The nature of the programme is such that prospective students can join the course at any time; however for administrative purposes it is preferred that students join the course in June.

Institutions delivering the course

This course is delivered by Centre for Defence Engineering (CDE), Centre for Electronic Warfare and Cyber (CEWC) & Centre for Defence Chemistry (CDC) in Cranfield Defence and Security (CDS) where the research interests include:

various aspects of expeditionary warfare systems such as weapons systems, communication systems, autonomous system, guidance , control , mobility, lethality, survivability and systems integration.

Cranfield University interacts with the following institutions and in the following ways:

CDS is already delivering approximately 40 modules in Shrivenham to both UK Ministry of Defence (MOD) and members of Allied countries/forces in the form of Master of Science programmes for guided weapons (GW), military electronics system engineering (MESE) and gun systems design (GSD). In addition, due to their expertise, CDE has provided consultancies to various government departments in the above areas. The programme (Expeditionary Warfare Systems Engineering and Technology MS) draws inspiration from Vehicle and Weapons Engineering MSc program, which has been running in TARDEC USA for last 18 years. The experience with TARDEC, helped the team to design this program to suite NSWC Crane requirements.
The programme (Expeditionary Warfare Systems Engineering and Technology MS) will be delivered on a part-time basis in the USA DoD establishments (NSWC Crane), in a flexible manner. All the teaching and/or assessment will be provided by the CDE &CEWC. It is a CDS, Cranfield University initiative and the programme has no partners or collaborators. However, it is anticipated that day to day mentoring during the student projects would be provided by respective head of the groups sponsoring the program. This mentoring will be provided under guidance of Cranfield faculty members.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This course is not accredited by any external bodies. However, course development team plans to submit the programme for accreditation after successful completion of first cohort and as soon as programme has met accreditation criterion.

2. What are the aims of the course?

Cranfield University offers this course in order :

- To introduce underpinning technologies and their application in defense systems, as required by the engineers and scientists from the US DoD and industry partners working in the design, development, prototyping, test, evaluation, acquisition and maintenance of Expeditionary Warfare systems.

- To provide graduates with the technical qualities, transferable skills and independent learning ability necessary to make them effective in organizations that design, develop, procure, or operate military expeditionary systems. The graduates will be equipped with skills & knowledge, which will help them move across the organisation both horizontally and vertically.

The course has significant theoretical content and students are expected to develop skills in independent learning in order to process the quantity of taught material effectively.
A group Expeditionary Warfare System Design Study (EWSDS) will be used to build team-working skills and explore the integration and trade-offs required in the design and development of platform, weapon and electronic systems in the current operational context. Group study is also designed to understand the user requirements and learn to apply a systems engineering approach in optimising the design. Attendees will be required to present their design to a critical audience and defend their design judgement and decisions.

An individual project /thesis presents the students with the opportunity to gain in-depth knowledge of a particular area of expeditionary systems engineering (80 credits).

This programme is intended for the following range of students:

- Although this is an open course and will be advertised on Cranfield website, it is expected that majority of the delegates will be from US DoD
- Test and evaluation engineers, design and development engineers, manufacturing and industrial engineers, specification engineers, physicists and mathematicians working in the field of Expeditionary Warfare systems.
- Military personnel, civil servants, defence industry, acquisition and procurement staff from DoD.

Graduates, who intend to take up their career in the defence technology (DoD and industry).

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate in Expeditionary Warfare Systems Engineering and Technology

In completing this course, and achieving the associated award, a diligent student should be able to:

ILO 1. Develop a comprehensive understanding of engineering principles associated with the expeditionary warfare system including its components and subsystems.

ILO 2. Appraise and evaluate the key technological disciplines associated with platforms, modern weapons and electronic warfare; and develop justification for performance variations in mechanical & electrical sub-systems that constitute expeditionary warfare system using modelling, simulation and experimental techniques.

ILO 3. Critically assess the performance, design and integration of expeditionary warfare systems (platforms, weapons & electronic information systems) in the face of conflicting and limited information; and perform design analysis of the expeditionary warfare components and sub-systems using computer-based modelling and simulation techniques; for example: ballistics, weapon system, platform design & performance and electronic warfare systems framework (radars, electro-optics, communication, etc).

B. Postgraduate Diploma in Expeditionary Warfare Systems Engineering and Technology

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

ILO 4. Develop appropriate selection criteria for inherently inter-linked constraints for each of the major technical disciplines associated with modern Expeditionary Warfare Systems Engineering and Technology & technology (e.g. signal processing, radar EW, weapon and platform estructures, electro-optices and infrared systems, warheads, aeroelasticity, materials, power supplies, explosives, etc.), and create a detailed technical framework on the design, operation and performance of a modern expeditionary warfare system.

ILO 5. Assess and appraise the principal trade-offs required to produce a successful expeditionary warfare systems design, while critically analysing the threat from Electronic Surveillance (ES) and Electronic Attack (EA) to typical military sensor and information systems. Specifically, the systems include radar, sonar, electro-optic and infrared sensors, communications systems and networks, communications and non-communications EW systems.

A. MSc in Expeditionary Warfare Systems Engineering and Technology

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

ILO 6. Assess new research ideas, concepts or methodologies through the use of a variety of techniques such as experimentation, analytical models and numerical models in order to perform an extended investigation into a given facet of interest concerning expeditionary warfare systems.

ILO 7. Formulate a systematic approach with engineering judgement to the design and integration of systems concerning expeditionary warfare in the face of conflicting and limited information using information retrieval, modelling, experimentation and/or theoretical analysis.

4. How is the course taught?

Students will be supported in their learning and personal development by:

The programme will provide students with the technical knowledge and understanding of expeditionary warfare systems to make them effective in specification, design, development and assessment. Special attention will be given to recent advances in global defence technologies, and to educating students in the analysis and evaluation of systems against changes and developments in the threat.

At the start of the course, students will receive an induction programme covering administrative matters such as registration and being a CU student and academic related matters such as Study Skills, student support and use of the VLE via a videoed lecture. For the students joining midway, if the group size is less than eight, induction program will be organised via combination of global classroom and video lectures.

The taught element of the programme will consist of 12-13 courses (modules) covering major aspects of expeditionary warfare technology, and providing a balanced and broad coverage of key aspects, critical issues and constraints associated with the design, development, performance and integration of expeditionary warfare systems. Where applicable, an optional pre-reading material will be made available via VLE for attendees to freshen up their fundamental back ground knowledge prior to the class.

The modular teaching programme culminates in a design study. This draws together the material taught in the preceding courses and considers a) the technical requirements and characteristics of expeditionary warfare systems and to examine the interactions between the various sub-systems and consequential compromises and trade-offs. b) the technical requirements and characteristics of

Electronic Warfare Systems and to examine the interactions between the various sub-systems and consequential compromises and trade-offs.

In addition to the teaching methods outlined above, students will be supported in their learning and personal development by undertaking computer based exercises specifically developed by the teaching team. Where possible, industry will be invited to provide industrial presepective in the form of visiting lecturer/guest speakers

Linking theory to real examples from warfare systems, adds credibility and builds confidence; therefore use of current and legacy equipment as a teaching aid to highlight design philosophy, design parameters and issues, constraints and trade-offs will be used as and when required.

Course tuition and project supervision will be undertaken as follows:

- The Centre for Defence Engineering (CDE) plans to visit DoD establishments, with appropriate facilities (NSWC, Crane), three times a year in April, June and Nov/Dec for two weeks each visit to deliver two courses per visit and 5 days of project supervision each year. This will allow delivery of 13 courses worth 120 credits, and project worth 80 credits.
- During each visit, CDE will send a team of academics and a module leader/course director to deliver the respective courses and supervision to the students.
- To ensure students are well prepared for courses, where required the module manager/course director will provide pre-reading material two weeks prior to the delivery of the course. Pre-reading material will be designed to provide background information necessary for the understanding of the critical design issues taught during the course. This module pre-reading material is optional and will require no more than 2 -8 hours of private study.
- Each module will consist of lectures to develop better understanding in the students and will be supported by tutorials, (proprietary and/or bespoke videos) laboratory and computer based exercises to explain the application of engineering and applied science using real life examples.
- Depending upon the type of module, written examination and course work assessment will be undertaken. This element will require 40-45 hours of private study. If the module is assessed by course work, students will be given eight weeks after the delivery of the course to complete their work and submit the assessment.
- Unless discussed and agreed prior to the module delivery, assessment by written examination will be undertaken on the last day of the module. This practice is agreed upon and followed in VWE (USA), hence it will be followed in this program also. More importantly, the administration of the examination process strictly follows the university examination procedures. Although some of the modules are borrowed from VWE course, different examination questions will be set. Coursework feedback will be given to students in accordance with University regulations. Project feedback will be given the week following each visit.
- During each visit, the project supervisor along with course director will organise one-to-one meetings with the students to discuss and monitor their progress. Project supervisors will also provide guidance and direction to the student(s). Any concerns and achievements will be documented and appropriate action will be taken to ensure that students' concerns are satisfactorily addressed. Where possible, project supervisors will be supported by local mentors. They may provide day to day mentoring but will not participate in assessment/grading.

To develop their confidence in conducting critical engineering analysis and systems evaluation, independent research and learning, students will undertake a group design study (EWSDS).

The Individual Project Aim
The overall aim of the project is to enable an individual student to develop, by first-hand experience, his expertise in engineering research, design or development in the field of expeditionary warfare system technology.

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 6. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. Postgraduate Certificate

The accumulation of 60 credits (or more) through the assessment of taught modules as detailed below:

Description	**Credits**
COMPULSORY MODULES:	
N/A	
ELECTIVE MODULES:	
Any 60 credits chosen from modules 1-20	
1. Communication Networks	10
2. Communications Engineering 1	10
3. Fundamentals of Ballistics	10
4. Electro-optics Systems for Expeditionary Warfare 1	10
5. Naval Weapons – Control and Guidance	10
6. Military Autonomous Vehicles	10
7. Fighting Vehicle Design	5
8. Modelling, Simulation and Control for Defence Engineering	5
9. Expeditionary Warfare Systems Design Study	10
(Note: Modules 7 and 8 must be taken as a pair)	
Weapon & Vehicle Specialization	
10. Light Weapon Design	10
11. Naval Weapon Structures, Aeroelasticity, and Propulsion	10
12. Naval Weapons Warheads, Explosives and Propellants	10
13. Weapon Systems Technology	10
14. Military Vehicle Propulsion	10
15. Military Vehicle Dynamics	10
Electronic Specialization	
16. Radar Sensing and EW	10
17. Electro-optics Systems for Expeditionary Warfare 2	10
18. Microwave Systems Engineering for Expeditionary Warfare	10
19. Communications Engineering 2	10
20. Data Processing for EW	10
TOTAL:	60

B. Postgraduate Diploma

The accumulation of 120 credits (or more) through the assessment of taught modules as detailed below:

Description	**Credits**
COMPULSORY MODULES:	
N/A	

ELECTIVE MODULES:	
1. Communication Networks	10
2. Communications Engineering 1	10
3. Fundamentals of Ballistics	10
4. Electro-optics Systems for Expeditionary Warfare 1	10
5. Naval Weapons – Control and Guidance	10
6. Military Autonomous Vehicles	10
7. Fighting Vehicle Design	5
8. Modelling, Simulation and Control for Defence Engineering	5
9. Expeditionary Warfare Systems Design Study	10
(Note: Modules 7 and 8 must be taken as a pair)	
Weapon & Vehicle Specialisation	
10. Light Weapon Design	10
11. Naval Weapon Structures, Aeroelasticity, and Propulsion	10
12. Naval Weapons Warheads, Explosives and Propellants	10
13. Weapon Systems Technology	10
14. Military Vehicle Propulsion	10
15. Military Vehicle Dynamics	10
Electronic Specialisation	
16. Radar Sensing and EW	10
17. Electro-optics Systems for Expeditionary Warfare 2	10
18. Microwave Systems Engineering for Expeditionary Warfare	10
19. Communications Engineering 2	10
20. Data Processing for EW	10
TOTAL:	120

C. MSc

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	**Credits**
COMPULSORY MODULES:	
21. Project	
ELECTIVE MODULES:	
1. Communication Networks	10
2. Communications Engineering 1	10
3. Fundamentals of Ballistics	10
4. Electro-optics Systems for Expeditionary Warfare 1	10
5. Naval Weapons – Control and Guidance	10
6. Military Autonomous Vehicles	10
7. Fighting Vehicle Design	5
8. Modelling, Simulation and Control for Defence Engineering	5
9. Expeditionary Warfare Systems Design Study	10
(Note: Modules 7 and 8 must be taken as a pair)	
Weapon & Vehicle Specialization	
10. Light Weapon Design	10
11. Naval Weapon Structures, Aeroelasticity, and Propulsion	10
12. Naval Weapons Warheads, Explosives and Propellants	10

13. Weapon Systems Technology	10
14. Military Vehicle Propulsion	10
15. Military Vehicle Dynamics	10
Electronic Specialization	
16. Radar Sensing and EW	10
17. Electro-optics Systems for Expeditionary Warfare 2	10
18. Microwave Systems Engineering for Expeditionary Warfare	10
19. Communications Engineering 2	10
20. Data Processing for EW	10
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria
The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of ≥50%;
- An average mark of ≥50% across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee); [3]
- **For Taught Assessments,** the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
  - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of ≥50% across the taught assessments);
  - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
  - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥40 credits, which are not part of the taught assessment average), the pass mark of ≥50% (where they exist);
- **For the thesis,** a mark of ≥50% in order to receive a pass (where it exists).

6. How is the course structured?

Part-time students register for the course in June preferably, however students can join the program from any module and are expected to complete the course within 5 years.

[3] Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of <40% (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award (<50%).

Overall, the programme is offered off-campus on a part-time basis only. The programme is divided into 2 main parts: the taught phase and the project/design study. Taught phase of the MSc course will be delivered over 4 years at DoD establishments in USA. Two modules will be taught per visit with two to three visits per year. The project will be integrated throughout the taught phase. The nature of the programme is such that prospective students can join the course at any time; however for administrative purposes it is preferred that students join the course in June. Each class will consist of maximum of 25 attendees. It is anticipated that some delegates may not be able to attend the modules sequentially due to the operational duties, which will allow additional delegates to register midway. Therefore, the course director will ensure that delegates should be able to complete the taught part within the stipulated time by taking hop-on hop-off approach by utilising the available slots on shared modules on both the VWE (USA) and EWSE programme. The sponsor is keen to increase the potential political value for collaboration across US Navy and Army. This strengthens the argument for economic cost sharing between the two sponsors (NSWC & TARDEC), thereby ensuring the viability and sustainability of the program within DoD. As a result, program has the following eight shared modules.

- Fighting Vehicle Design
- Modelling, Simulation and Control for Defence Engineering
- Military Vehicles Propulsion
- Military Vehicle Dynamics
- Fundamentals of Ballistics
- Light Weapon Design
- Weapon Systems Technology
- Military Autonomous Vehicles

7. Course Level Assessment Strategy[4]

The course uses a number of different assessment types, both exam and coursework. With regard to the coursework a range of tasks are set including:
Research and brief – both oral and written
Simulation and analysis tasks
Written reports related to experimental tasks
Case studies and design studies (both completed individually and as part of a group
The assessment of the final project (MSc only) is completed by written thesis, supplemented by an oral viva and project poster.
Full details can be found in the module descriptors for each aspect of the course.

[4] Guidance to aid colleagues writing or updating a course-level assessment strategy for inclusion in the Course Specification can be found as Appendix K in either the Senate Handbook on Setting up a New Taught Course or the Senate Handbook on Managing Taught Courses https://intranet.cranfield.ac.uk/EducationServices/Pages/SenateHandbooksA-Z.aspx

Course modules

The following modules outline all parts of the programme leading to MSc. Other awards associated with the course include some or all of these modules.

Module Number	Module code	Title	Module Leader	Contact hours[5]	Total hours delivered by Visiting Lecturers[6]	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	'Residential' Start Date	'Residential' End Date	Minimum Mark[7] - 40% or 50%	Type of Assessment	Weighting within module8 (%) of Independent assessments	Weighting within module of multi-part assessments [9](100%)	Type of Assessment	Weighting of individual elements of multi-part assessment[10]	Assessment Submission and/or exam date[11]	Assessment / Exam Retake date
1	R-EWS-CN	Communication Networks	Phil Nobles	38	0	10	N		Not running		50	ICW	100					
2	R-EWS-CE1	Communications Engineering 1	TBD	38	0	10	N		Not running		50	EX ICW	50 50					
3	R-VWE-FB	Fundamentals of Ballistics	Derek Bray	38	0	10	Y		Not running		50	EX ICW	50 50					
4	R-EWS-ESEW	Electro-optics Systems for Expeditionary Warfare – Part 1	Dr David James	38	0	10	N		Not running		50	EX ICW	50 50					

[5] Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice
[6] Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)
[7] A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.
[8] For **independent assessments** please record type and weighting of each separate piece of assessment individually.
[9] For **multi-part assessments** please record the overall weighting of module which should be 100%.
[10] Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate*).* If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.
[11] Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.
Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours[5]	Total hours delivered by Visiting Lecturers [6]	Credits	Is the module shared? Y/N	Calendar			Assessment								
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark[7] - 40% or 50%	Type of Assessment	Weighting within module8 (%) of Independent assessments	Weighting within module of multi-part assessments [9](100%)	Type of Assessment	Weighting of individual elements of multi-part assessment[10]	Assessment Submission and/or exam date[11]	Assessment / Exam Retake date
5	R-EWS-NWCG	Naval Weapons – Control and Guidance	Dr John Economou	38	0	10	N		Not running		50	EX ICW	50 50					
6	R-VWE-MAV	Military Autonomous Vehicles	Dr John Economou	38	0	10	Y	08/04/24	08/04/24	12/04/24	50	EX ICW	50 50				12/04/24 07/06/24	TBC TBC
7	R-VWE-FVD	Fighting Vehicle Design	Prof Amer Hameed	38	1	5	Y		Not running		50	ICW EX	50 50					
8	R-VWE-MSCDE	Modelling, Simulation and Control for Defence Engineering	Dr David Wall	38	0	5	Y		Not running		50	ICW	100					
9	R-EWS-EWSDS	Expeditionary Warfare Systems Design Study	Prof Amer Hameed	55	0	10	N		Not running		50	ICW	100					
10	R-VWE-LWD	Light Weapon Design	Mr Steve Champion	38	0	10	Y		Not running		50	ICW EX	50 50					
11	R-EWS-NWSAP	Naval Weapons Structures, Aeroelasticity and Propulsion	Dr A Saddington	38	0	10	N		Not running		50	EX ICW	50 50					
12	R-EWS-NWWEP	Naval Weapons Warheads, Explosives, Propellants and Materials	Dr Guillaume Kister	38	0	10	N		Not running		50	EX ICW	50 50					

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours[5]	Total hours delivered by Visiting Lecturers [6]	Credits	Is the module shared? Y/N	Calendar			Assessment								
												Independent Assessment		Multi-part Assessment			Submission dates		
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark[7] - 40% or 50%	Type of Assessment	Weighting within module8 (%) of Independent assessments	Weighting within module of multi-part assessments [9](100%)	Type of Assessment	Weighting of individual elements of multi-part assessment[10]	Assessment Submission and/or exam date[11]	Assessment / Exam Retake date
13	R-VWE-WST	Weapon Systems Technology	Steve Champion	38	5	10	Y		Not running		50	ICW EX	50 50						
14	R-VWE-MVP	Military Vehicles Propulsion	Dr Thiru Thirulogasingam	38	0	10	Y		Not running		50	ICW EX	50 50						
15	R-VWE-MVD	Military Vehicle Dynamics	Ajay Kumar	38	0	10	Y	18/03/24	18/03/24	22/03/24	50	ICW EX	50 50				17/05/24 22/03/24		
16	R-EWS-RSEW	Radar Sensing and Expeditionary Warfare	Ioannis Vagias	38	0	10	N		Not running		50	EX ICW	50 50						
17	R-EWS-ESEW2	Electro-optics Systems for Expeditionary Warfare – Part 2	Dr David James	38	0	10	N		Not running		50	ICW	100						
18	R-EWS-MSEW	Microwave Systems Engineering for Expeditionary Warfare	Dr Ivor Morrow	38	0	10	N		Not running		50	ICW EX	50 50						
19	R-EWS-CE2	Communications Engineering 2	Peter Barker	38	0	10	N		Not running		50	EX ICW	50 50						
20	R-EWS-DPEW	Data Processing for Expeditionary Warfare	Dr Venkat Sastry	38	0	10	N		Not running		50	EX ICW	50 50						

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours[5]	Total hours delivered by Visiting Lecturers [6]	Credits	Is the module shared? Y/N	Calendar			Assessment								
												Independent Assessment		Multi-part Assessment			Submission dates		
								Module Start Date (eg Pre-course task)	' Residential' Start Date	' Residential' End Date	Minimum Mark[7] - 40% or 50%	Type of Assessment	Weighting within module8 (%) of Independent assessments	Weighting within module of multi-part assessments [9](100%)	Type of Assessment	Weighting of individual elements of multi-part assessment[10]	Assessment Submission and/or exam date[11]	Assessment / Exam Retake date
21	R-EWS-THESIS	Thesis	Ajay Kumar	20		80			~~07/04/23~~ 05/04/24	~~08/04/24~~ 07/04/25	50	THESIS	100				08/04/24	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Please list all modules that are used by another existing course.

Module code	**Module title**	**Course that owns the module**	**Other course(s)/ programme(s) that use the module**
R-VWE-FB	Fundamentals of Ballistics	Vehicle and Weapon Engineering, USA	Vehicle and Weapon Engineering, USA
R-VWE-MAV	Military Autonomous Vehicles	Vehicle and Weapon Engineering, USA	Vehicle and Weapon Engineering, USA
R-VWE-FF	Fighting Vehicle Design	Vehicle and Weapon Engineering, USA	Vehicle and Weapon Engineering, USA
R-VWE-MSCDE	Modelling, Simulation and Control for Defence Engineering	Vehicle and Weapon Engineering, USA	Vehicle and Weapon Engineering, USA
R-VWE-LWD	Light Weapon Design	Vehicle and Weapon Engineering, USA	Vehicle and Weapon Engineering, USA
R-VWE-WST	Weapon Systems Technology	Vehicle and Weapon Engineering, USA	Vehicle and Weapon Engineering, USA
R-VWE-MVP	Military Vehicle Propulsion	Vehicle and Weapon Engineering, USA	Vehicle and Weapon Engineering, USA
R-VWE-MVD	Military Vehicle Dynamics	Vehicle and Weapon Engineering, USA	Vehicle and Weapon Engineering, USA

8. How are the ILOs assessed?

The following assessment types are utilised:

The course uses a range of assessment types including written examination, coursework, thesis and oral examination

This approach has been adopted because:

This approach has been adopted to assess the intended learning outcomes and the weighting of assessment, particularly the use of written examinations addresses the educational expectation of the USA market

Assessment and ILO Mapping

A. Postgraduate Certificate

Award ILOs / Module No.	ILO1	ILO2	ILO3
1	ICW	ICW	ICW
2	EX ICW	EX ICW	EX ICW
3	EX ICW	EX ICW	EX ICW
4	EX ICW		EX ICW
5	EX ICW	EX ICW	EX ICW
6	EX ICW	EX ICW	EX ICW
7	EX ICW		EX ICW
8	ICW	ICW	ICW
9	ICW	ICW	ICW
10	EX ICW		EX ICW
11	EX ICW	EX ICW	EX ICW
12	EX ICW	EX ICW	
13	EX ICW	EX ICW	EX ICW
14	EX ICW	EX ICW	
15	EX ICW	EX ICW	EX ICW
16	EX ICW	EX ICW	EX ICW
17	ICW	ICW	ICW
18	EX ICW	EX ICW	EX ICW
19	EX ICW	EX ICW	EX ICW
20	EX ICW	EX ICW	EX ICW

B. Postgraduate Diploma

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs / Module No.	ILO4	ILO5
1		ICW
2	EX ICW	EX ICW
3		EX ICW
4	EX ICW	
5	EX ICW	EX ICW
6	EX ICW	EX ICW
7		EX ICW
8		ICW
9	ICW	ICW
10	EX ICW	EX ICW
11	EX ICW	EX ICW
12	EX ICW	
13	EX ICW	EX ICW
14	EX ICW	EX ICW
15	EX ICW	EX ICW
16	EX ICW	EX ICW
17	ICW	ICW
18	EX ICW	
19	EX ICW	EX ICW
20	EX ICW	

C. MSc

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs / Module No.	ILO6	ILO7
1	ICW	ICW

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Award ILOs / Module No.	ILO6	ILO7
2	EX ICW	
3		EX ICW
4	EX ICW	
5	EX ICW	EX ICW
6	EX ICW	
7		EX ICW
8	ICW	ICW
9	ICW	ICW
10		
11		EX ICW
12		
13	EX ICW	
14		EX ICW
15		EX ICW
16	EX ICW	EX ICW
17		ICW
18	EX ICW	EX ICW
19	EX ICW	
20	EX ICW	EX ICW
21	THESIS	THESIS

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	Modules Covered	Assessment	
		Type	Weight (%)

9. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic

staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who provides authoritative guidance on policy and procedure to the Panel. Proposals are reviewed in line with the UK Quality Code for Higher Education. New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guiding principles to meet the Expectations and Core Practices of the UK Quality Code for Higher Education. External examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the UK Quality Code for Higher Education. The delivery of new partnership provision is ultimately approved by the Universities Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as

a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

10. What opportunities are graduates likely to have on completing the course?

This programme is intended for the following range of students as part of their continuing professional development to improve their skills in their current role and to enhance career progression opportunities within their current organisations:

- Test and evaluation engineers, design and development engineers, manufacturing and industrial engineers, specification engineers, physicist and mathematicians working in the warfare system design, researchers and analysts working in the design and development of expeditionary warfare system
- Graduates, who intend to take up a career in defence technology (DoD and industry)
- Military personnel, government civil servants, defence industry, acquisition and procurement staff from DoD

This programme will provide the following skills:

- Cement and consolidate industrial experience with the relevant technical background to enable decision making.
- Expand and enhance knowledge of the subjects taught to apply this within your current role.
- Develop and enhance analysis of systems in their current roles.
- Blend industry standards with modern, novel and cutting edge techniques.
- Multidisciplinary knowledge in expeditionary warfare enables improved communication between experts in different fields, and enable the employee to take up managerial responsibilities over teams of staff in these areas.
- Education gained from the Ex War SE program develops knowledge to enable the employee to be a smart customer.
- Knowledge gained from this programme gives attendees the capability to work between Naval and Army Command.)

COURSE SPECIFICATION

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

Date of first publication/latest revision: June 2024

1. What is the course?

Course information

Course Title	Explosives Ordnance and Engineering
Course code	MSEOEFTR, MSEOEPTR, MSEOEPAR, PDEOEFTR, PDEOEPTR, PCEOEFTR, PCEOEPTR, & SPEOEPTR
Academic Year	2023/24
Valid entry routes	MSc, PgDip, PgCert, Apprenticeship MSc
Additional exit routes	As above
Mode of delivery	Full-time and Part-time
Location(s)[1] of Study	Shrivenham
School(s)	Cranfield Defence and Security
Theme	Defence and Security
Centre	Centre for Defence Chemistry
Course Director	Dr Tracey Temple
Awarding Body	Cranfield University
Is this an AP Contract course?[2]	Yes
Is this course offered as a Cranfield Mastership?	Yes
Apprenticeship Standard the course is mapped to	ORDNANCE MUNITIONS AND EXPLOSIVES SPECIALIST
Is the Degree apprenticeship integrated or non-integrated?	Integrated
Is the Mastership offered as an open and/or closed course?	Open
Teaching Institution	Cranfield University

[1] If any part of this course is delivered at another site, please note which one(s) here
[2] AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Admissions body	Cranfield University
Entry requirements	Degree in science or science related subject or exceptionally with at least 7 years relevant experience. If you are entering the Masters programme through the experiential route, then up to three successful completions of EOE modules can be used as part of the case to provide supporting evidence of academic ability for entry onto the EOE. IELTS score of 7.0 required by students for whom English is not a first language
UK Qualifications Framework Level	QAA FHEQ level 7 (Masters)
Benchmark Statement(s)	N/A
Registration Period(s) available	Full-time MSc, PgDip, PgCert – 1 year Apprenticeship 26 months plus 6 months End Point Assessment Part-time PgCert – 3 years, PgDip – 4 years and MSc 5 Years.
Course Start Month(s)	September (full-time/part-time)

Institutions delivering the course

This course is delivered by Cranfield Defence and Security where the research interests include:

explosive science and safety, energetic materials and synthesis, ordnance, chemical defence, fuels, environmental science, forensic and forensic computing, molecular modelling, high strain-rate physics, weapons and vehicle systems, aeromechanical systems, defence materials (armour), defence analysis

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This MSc course is accredited by the Institution of Engineeing and Technology (IET) until August 2026 and the Institution of Engineering and Technology (IMechE) until August 2029 on behalf of the Engineering Council as meeting the requirements for Further Learning for registration as a Chartered Engineer (CEng). Candidates must hold a CEng accredited BEng/BSc (Hons) undergraduate first degree to comply with full CEng registration requirements.

2. What are the aims of the course?

To provide military officers, defence industry staff, government servants and civilian students with the advanced academic background necessary for them to contribute effectively to technically demanding projects in the field of explosives and explosives ordnance and engineering.

The course also aims to enable students to:

- independently learn and to gain the ability to advance their knowledge and understanding in the topic of EOE and to develop academic and practical skills to a higher level
- predict possible accident scenarios associated with a particular activity; to analyse critically the risks and to prioritise the risks with likely outcome balanced against probability of occurrence; to propose mitigating activities to reduce the risk and ensure a safe working environment.

Postgraduate Diploma (PgDip) and Postgraduate Certificate (PgCert) entry and exit routes are provided for students who wish to access only parts of the course provided. Exit routes are not offered as part of the apprenticeship programme.

This programme is intended for the following range of students:

- Military UK and International, (Army, RN, RAF)
- Civil services

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate

In completing this course, and achieving the associated award, a diligent student should be able to:

ILO 1. A systematic application and a critical understanding of current research at the forefront of explosives and explosives ordnance engineering, together with the capacity to evaluate its relevance to industrial and commercial practice

ILO 2. Conceptual thinking that enables the student to evaluate critically current research and methodologies, develop critiques of them and adapt them in the context of both advanced scholarship and industrial, commercial, and professional relevance, using many of the analytical procedures within the armoury of the explosive engineer or scientist

ILO 3. An ability to acquire and use information effectively in any appropriate medium, including the increasing range of networked information resources from a wide range of adjacent disciplines in engineering, physical and forensic sciences that impact on explosive ordnance engineering

ILO 4. Originality in the application of knowledge, including data and information collected by the student in relation to essays focusing on explosives and explosives ordnance engineering

ILO 5. To be able to compile, reduce and sort a large body of information, from a variety of sources, to critically examine and analyse this information and communicate, with clarity, pertinent information derived from these sources, which manifests as new material (in that it is greater than the sum of the parts of the material assimilated)

ILO 6. Self-direction and originality in tackling and solving problems, working effectively at a professional level making informed judgements in the absence of complete data and communicating conclusions clearly, both orally and in writing, to specialist and non-specialist audiences

B. Postgraduate Diploma

In completing this course, and achieving the associated award, a diligent student should be able to:

ILO 7. Peer review, grading and prioritisation of presented work against a clear assessment framework; an indispensable ability because funding for any endeavour is likely finite.

C. MSc

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

ILO 8. Originality in the application of knowledge, including data and information collected by the student in relation to an extended individual project focusing on explosives and explosives ordnance engineering

ILO 9. A critical ability and originality of thought through the planning and execution of a detailed research project and present the outcomes and conclusions in an oral format to a variety of audiences

ILO 10. An ability to critically review established explosive ordnance engineering practice in a particular field, write a clear explanation of experimental/analytical procedures and the presentation of results by appropriate means, and present a self-critical discussion of experimental/analytical results with conclusions that place the research in the context of the professional practice in explosive ordnance engineering

ILO 11. Experience in writing Safe Operating Procedures and COSHH and methods of securing health and safety data from a variety of sources

D. Apprenticeship MSc

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

ILO 8. Originality in the application of knowledge, including data and information collected by the student in relation to an extended individual project focusing on explosives and explosives ordnance engineering

ILO 9. A critical ability and originality of thought through the planning and execution of a detailed research project and present the outcomes and conclusions in an oral format to a variety of audiences

ILO 10. An ability to critically review established explosive ordnance engineering practice in a particular field, write a clear explanation of experimental/analytical procedures and the presentation of results by appropriate means, and present a self-critical discussion of experimental/analytical results with conclusions that place the research in the context of the professional practice in explosive ordnance engineering

ILO 11. Experience in writing Safe Operating Procedures and COSHH and methods of securing health and safety data from a variety of sources

4. How is the course taught?

Students will be supported in their learning and personal development by:

- Technology School TS a facility, which presents defence technology-related educational material in an integrated approach, under one roof, using modern delivery methods in order to enhance defence technology education capabilities. The Defence Academy is the only educational establishment in the UK with the means to do this and is thus ideally placed to develop and champion higher level thinking. The TS has at its heart an integrated education system which enables students to access the full range of educational, experimentation and research material across all domains. To help achieve this it is equipped with a wealth of real (operational) military hardware including, for example, tanks, guns, armoured vehicles, rockets, ammunition and protective personal equipment. Teaching in

this environment enables the students unprecedented hands-on learning, which cannot be achieved in a 'lecture-room-and-slides' environment.

- Poster generation and presentation: Here students are given a necessarily vague title for a topic and asked to produce an A0 size poster within three hours. The students work in groups of five and are given minimal instruction. Students must work in an unfamiliar area, where the only direction is from their initiative, teamwork and communication skills and computational search abilities. Students are then asked to criticise each other's posters with three positive points and three negative points. This is to help students acclimatise to the 'research environment', where there is no 'correct answer' and direction must be self-driven. This helps students capture and illustrate 'M-level descriptors' associated with a Master's programme as distinct from a first degree.
- Thought experiments: A particular scenario is given and the students describe how they might perform an experiment to understand a particular phenomenon. The 'results' of the experimentation chosen are predicted by the lecturer based upon knowledge. Analysis and understanding models then predicted by the student and moulded/ adjusted to conform to current accepted models of understanding. Such methods are valuable in areas such as explosives where direct experimentation is difficult, not possible or too dangerous.
- Computational experiments: Students have the opportunity to perform computer simulations (rather than experimentation) of various areas. For example, they will be asked to use a computer code to simulate blast from an explosive in a busy street and predict possible outcomes. Specifically, they are requested to use the simulation codes to explore the possibilities and capabilities. This is necessarily slow, and sometimes frustrating, but it provides the students with insight into the simulation arena and its inherent limitations; 'the computer answer is not always correct'. This is supplemented with case studies to show the full scope and capability of the codes if they were to be used by experienced 'expert' users.
- Peer review and prioritisation: Funding for any endeavour is finite and therefore our students will, in their future roles, need to arbitrate upon projects/endeavours that are to be funded and those that are not to be funded. To further develop this important skill, students are asked in groups to carry out 'horizon scanning' – exploring future developments in the EOE arena. They will then present orally their findings to the whole course. Individually, students will then 'peer review' and grade each of the proposed new areas against a clear assessment framework. Finally, they will prioritise each of the proposed areas against their chosen criterion, with the top 30% being (hypothetically) funded. This will furnish students with the knowledge and associated challenges of prioritisation. It will also help them empathise with how, for example, courses are run and structured.
- Immersion in a working testing laboratory: Many laboratory based teaching environments are simulants of in-practice 'industrial' working, which can prove limited in the dissemination of 'real-world' practices. Here, we immerse students into a working testing laboratory. Rather than use downscaling of particular tests in a central laboratory, students will be introduced and educated in a working testing environment. Here they will be better able to appreciate constraints of, for example, size, time, equipment, safety procedures, management, planning, preparation and reporting.
- Research project: Most projects are practically driven and require extensive use of (explosive) range and specialist laboratory facilities. Here students will liaise with technicians and other supporting staff (including supervisors). Planning, logistical and time management skills are crucial to offset range availability, cost and difficulty associated with sourcing explosive materials. Also the need to convince, enthuse and inspire supporting staff of the approach is a valuable skill that will help drive the project. Here safety protocols must be carefully written, argued and communicated to convince liaising staff that it is safe to participate and ultimately allow the proposed programme of work. All these challenges reflect conditions in a professional environment.

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 6.

Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. Postgraduate Certificate

The accumulation of 60 credits through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Research Tools – Parts 1&2	10
Introduction to Explosives Engineering	10
Munitions & Target Response	20
ELECTIVE MODULES:	
Introductory Studies	0
Gun Propellants	10
Testing and Evaluation of Explosives	10
Rocket Motors and Propellants	10
Pyrotechnics	10
Explosives and the Environment	10
Maritime & Underwater Munitions	10
Manufacture & Material Properties of Explosives	10
Delivery Systems	10
Addressing EOE Capability Gaps	20
Counter Improvised Explosive Devices Capability	10
Design for Vulnerability	10
Safety Assurance in EOE	10
TOTAL:	**60**

[1] Senate Regulations require a minimum of 60 learning credits to be accumulated for the Award of PgCert. The number of learning credits for individual courses is set during course validation.

[1] Senate Regulations require a minimum of 120 learning credits to be accumulated for the Award of PgDip. The number of learning credits is set during course validation.

B. Postgraduate Diploma

The accumulation of 120 credits through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Research Tools– Parts 1&2	10
Introduction to Explosives Engineering	10
Munitions & Target Response	20
Future Development: Scanning the Horizon in EOE	20
ELECTIVE MODULES:	
Introductory Studies	0
Gun Propellants	10
Testing and Evaluation of Explosives	10
Rocket Motors and Propellants	10
Pyrotechnics	10
Explosives and the Environment	10
Maritime & Underwater Munitions	10

Manufacture & Material Properties of Explosives	10
Delivery Systems	10
Addressing EOE Capability Gaps	20
Counter Improvised Explosive Devices Capability	10
Design for Vulnerability	10
Safety Assurance in EOE	10
TOTAL:	**120**

C. MSc

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	**Credits**
COMPULSORY MODULES:	
Research Tools – Parts 1&2	10
Introduction to Explosives Engineering	10
Munitions & Target Response	20
Future Development: Scanning the Horizon in EOE	20
Thesis	80
ELECTIVE MODULES:	
Introductory Studies	0
Gun Propellants	10
Testing and Evaluation of Explosives	10
Rocket Motors and Propellants	10
Pyrotechnics	10
Explosives and the Environment	10
Maritime & Underwater Munitions	10
Manufacture & Material Properties of Explosives	10
Delivery Systems	10
Addressing EOE Capability Gaps	20
Counter Improvised Explosive Devices Capability	10
Design for Vulnerability	10
Safety Assurance in EOE	10
TOTAL:	**200**

D. Apprenticeship MSc

An Apprenticeship MSc will be awarded on successful completion of 200 credits as outlined below:

Description	**Credits**
COMPULSORY MODULES:	
Introductory Studies	0
Research Tools – Parts 1&2	10
Introduction to Explosives Engineering	10
Munitions & Target Response	20
Delivery Systems	10
Future Development: Scanning the Horizon in EOE	20
Safety Assurance in EOE	10
Testing and Evaluation of Explosives	10
Rocket Motors and Propellants	10
Design for Vulnerability	10

Explosives in the Environment End Point Assessment	10 80
TOTAL:	**200**

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria
The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of ≥50%;
- An average mark of ≥50% across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee); [3]
- **For Taught Assessments,** the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
  - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of ≥50% across the taught assessments);
  - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
  - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥40 credits, which are not part of the taught assessment average), the pass mark of ≥50% (where they exist);
- **For the thesis,** a mark of ≥50% in order to receive a pass (where it exists).
- **For the integrated EPA, the pass criteria is contained within the Standard Assessment Plan**

6. How is the course structured?

Full-time students register for the course in September and are expected to complete the course within 12 calendar months.

Part-time students register for the course in September and are expected to complete the course within five years. Please note part time MSc students start their project in the January, attend the Oral in July and submit their project via the VLE the following January. So part time students have 1 year to complete their project

[3] Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of <40% (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award (<50%).

Apprentices will study the taught modules over a period of 26 months, and then end point assessment will typically be a period of 6 months.

The taught phase for each 10-credit module is usually completed within one week there is structured teaching to allow time for more independent learning and reflection for Full-time students. The main exception is the Future Developments module which runs from October to March/April (part-time students must have completed at least half of the taught phase before they enrol for this module). Industrial visits are scheduled throughout the course to support student learning.

7. Course Level Assessment Strategy[4]

Students are assessed by formative and summative approaches. Formative assessment can be group and individual workshops, class debates, virtual platform learning. Summative assessments include, formal examinations, oral presentations, coursework, poster presentations and peer review activities.

[4] Guidance to aid colleagues writing or updating a course-level assessment strategy for inclusion in the Course Specification can be found as Appendix K in either the Senate Handbook on Setting up a New Taught Course or the Senate Handbook on Managing Taught Courses https://intranet.cranfield.ac.uk/EducationServices/Pages/SenateHandbooksA-Z.aspx

Course modules

The following modules outline all parts of the programme leading to MSc. Other awards associated with the course include some or all of these modules.

Module Number	Module code	Title	Module Leader	Contact hours[5]	Total hours delivered by Visiting Lecturers [6]	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[7] - 40% or 50%	Type of Assessment	Weighting within module[8] (%) of Independent assessments	Weighting within module of multi-part assessments [9](100%)	Type of Assessment	Weighting of individual elements of multi-part assessment[10]	Assessment Submission and/or exam date[11]	Assessment / Exam Retake date
1	R-EOS-IS	Introductory Studies A23	C. Williams & J. Pons	62	0	0	N	05/09/23	05/09/23	15/09/23	N/A	AO	N/A				N/A	
2	R-EOS-RT	Research Tools Part 1 A23	T. Temple & R. Hazael	35	0	10	N	18/09/23	18/09/23	19/09/23	50	OR	100				07/11/23	09/01/24
		Research Tools Part 2 A23						02/10/23	02/10/23	04/10/23								

[5] Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice
[6] Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)
[7] A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%. This will be at the Board of Examiners discretion.
[8] For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education
[9] For **multi-part assessments** please record the overall weighting of module which should be 100%. Multipart assessments should only be included in courses where there is a clear androgogical reason and where each element forms part of a continuous learning and assessment experience for students.
[10] Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate*).* If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.
[11] Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours[5]	Total hours delivered by Visiting Lecturers [6]	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[7] - 40% or 50%	Type of Assessment	Weighting within module[8] (%) of Independent assessments	Weighting within module of multi-part assessments [9](100%)	Type of Assessment	Weighting of individual elements of multi-part assessment[10]	Assessment Submission and/or exam date[11]	Assessment / Exam Retake date
3	R-EOS-IE	Introduction to Explosives Engineering A23	T. Temple & P. Norton	35	0	10	N	25/09/23	25/09/23	29/09/23	50	EX	100				27/10/23	05/01/24
		B23						08/04/24	08/04/24	12/04/24	50	EX	100				17/05/24	12/07/24
4	R-EOS-FDSHE	Future Developments: scanning the Horizon in EOE A23	T. Temple & L. Nelson	35	0	20	N	16/10/23	16/10/23	17/10/23	50	GPRES GCW OR	20 20 60				04/01/24 19/02/24 19-20/3/24	19/03/24 23/04/24 28/05/24
5	R-EOS-MTR	Munitions and Target Response A23	A. Helliker & R.Critchley	60	0	20	N	23/10/23	13/11/23	24/11/23	50	GPRES EX	50 50				24/11/23 15/01/24	06/02/24
6	R-EOS-MMPE	Manufacture and Materials Properties of Explosives A23	L. Dossi & J. Pons	33	4	10	N	30/10/23	30/10/23	03/11/23	50	OR	100				17-19/01/24	14/03/24
7	R-EOS-ACG	Addressing EOE Capability Gaps A23	P. Norton & R. Hazael	70	0	20	N	21/09/23	21/09/23	21/09/23	50	GPRES GCW	60 40				22/03/24 12/04/24	
8	R-EOS-AS2	Delivery Systems A23	A.Helliker & S. Champion	30	0	10	N	04/12/23	04/12/23	08/12/23	50	EX	100				12/02/24	19/04/24

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours[5]	Total hours delivered by Visiting Lecturers [6]	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[7] - 40% or 50%	Type of Assessment	Weighting within module[8] (%) of Independent assessments	Weighting within module of multi-part assessments [9](100%)	Type of Assessment	Weighting of individual elements of multi-part assessment[10]	Assessment Submission and/or exam date[11]	Assessment / Exam Retake date
9	R-EOS-GPIBWT	Gun Propellants A23	N. Mai & L. Nelson	35	0	10	N	02/01/24	08/01/24	12/01/24	50	EX	100				16/02/24	19/04/24
10	R-EOS-SAE	Safety Assurance in EOE A23	L. Nelson & L Humphries	35	3	10	N	11/03/24	11/03/24	15/03/24	50	ICW	100				18/04/24	
11	R-FP-CEDC	Counter Improvised Explosive Devices Capability A23	M. Harris	28	0	10	Y	18/03/24	18/03/24	22/03/24	50	IPRES	100				Presentation submission date:22/04/24 Oral presentation dates: 7th and 8th May 2024	NEXT AVAILABLE OPPORTUNITY
12	R-EOS-TEE	Testing and Evaluation of Explosives A23	N. Mai & C. Stennett	37	3	10	N	29/01/24	29/01/24	02/02/24	50	ICW	100				05/03/24	08/05/24
13	R-EOS-RMP	Rocket Motors and Propellants A23	T. Temple & P. Gill	28	6	10	Y	09/01/24	05/02/24	09/02/24	50	EX	100				19/03/24	31/05/24
14	R-EOS-PT	Pyrotechnics A23	R. Vrcelj & L. Humphreys	30	0	10	N	04/03/24	04/03/24	08/03/23	50	ICW	100				24/04/24	25/06/24
15	R-EOS-EE	Explosives and the	T. Temple & M Ladyman	35	10	10	N	11/12/23	11/12/23	15/12/23	50	ICW	100				06/02/24	09/04/24

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

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		Environment A23																
16	R-EOS-CE	Commercial Explosives A23	R. Vrcelj & L. Humphries	35		10	N		NOT RUNNING IN AY 23/24		50	EX	100					
17	R-EOS-DV	Design for Vulnerability A23	S. Gaulter & P. Norton	30		10	N	22/01/24	22/01/24	26/01/24	50	ICW	100				23/02/24	26/04/24
20	R-EOS-MUM	Maritime and Underwater Munitions	T. Temple & F. Persico	35		10	N	27/11/23	27/11/23	01/12/23	50	ICW	100				20/01/24	26/03/24
18	R-EOE-THESIS	Thesis	T. Temple & M. Ladyman	40		80	N	N/A	Full Time 02/01/24	**A23** 18/07/24 26/07/24	 50 50	 ORAL THESIS	 25 75				 18/07/24 26/07/24	
									Part Time July 02/01/24	**B23** 18/07/24 27/09/25	 50 50	 ORAL THESIS	 25 75				 18/07/24 27/09/24	
19	R-EOA-THESIS	End Point Assessment	T. Temple & R. Vrcelj	40		80	N	N/A	04/09/23	TBC	50	Project with presentat	50				EPA 15/05/25	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours[5]	Total hours delivered by Visiting Lecturers [6]	Credits	Is the module shared? Y/N	Calendar			Assessment							
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								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[7] - 40% or 50%	Type of Assessment	Weighting within module[8] (%) of Independent assessments	Weighting within module of multi-part assessments [9](100%)	Type of Assessment	Weighting of individual elements of multi-part assessment[10]	Assessment Submission and/or exam date[11]	Assessment / Exam Retake date
												ion IPROJ OR	25 25					

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

EOE Thesis Timeline
Thesis titles will be distributed in November for all students eligible to proceed to the thesis phase and they are to select 3 preferences for their thesis title. Part time students must inform the Course Director that they wish to complete their thesis prior to the start of November to ensure they receive the titles when released. Part time Students will need 1 year of registration remaining to complete the thesis. Students will then have 3 weeks from the title release date to let the Course Director know of their choices. Students wishing to use their own title must inform the Course Director of their title prior to the release date to ensure there is available supervisors, the topic is suitable and achievable, and that the topic is not captured as part of an existing thesis title. The Course Director will confirm before the Christmas break what project title each student has been assigned and a relevant supervisory team.

Students will formally start their thesis at the beginning of the following January. Oral presentations will be in July for all students. Full time students will submit their final written thesis at the end of July and for part time students it will be September (this will be in-line with the end of the registration period).

To support students with their thesis there will be a thesis writing workshop in February, which will outline the requirements for the final submission structure, experimental design and planning, resourcing and health and safety procedures.

Please list all modules that are used by another existing course.

Module code	**Module title**	**Course that owns the module**	**Other course(s)/ programme(s) that use the module**
R-EOS-RMP	Rocket Motors and Propellants	Explosive Ordnance Engineering	Weapon & Vehicle Systems
R-FP-CEDC	Counter Improvised Explosive Devices Capability	Forensic Programme	Explosive Ordnance Engineering & Counter Terrorism

8. How are the ILOs assessed?

The following assessment types are utilised:

Oral presentation (ORAL), Group Presentation (GPRES), Examination (EX), Group Coursework (GCW), & Coursework (CW)

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

(Module numbers should correspond with those used in the Course module table above.)

A. Postgraduate Certificate, Diploma and MSc

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs / Module No.	ILO 1	ILO 2	ILO 3	ILO 4	ILO 5	ILO 6	ILO 7	ILO 8	ILO 9	ILO 10	ILO 11
2	OR	OR		OR	OR	OR					
3					EX						
4	OR/GPRES		OR/GPPRES		OR	OR	GCW				
5	GPRES/EX	GPRES/EX	GPRES/EX		GRPES	GPRES					
6	OR	OR			OR	OR					
7	GPRES/GCW	GPRES/GCW	GPRES/GCW	GRPRES	GPRES/GCW	GPRES/GCW					
8	EX	EX			EX	EX					
9	EX	EX	EX	EX	EX						
10			ICW	ICW		ICW					
11		IPRES	IPRES	IPRES	IPRES						
12	ICW	ICW	ICW		ICW	ICW					
13	EX	EX	EX		EX						
14			ICW			ICW					
15	ICW			ICW	ICW	ICW					
16											
17	ICW	ICW		ICW	ICW						
18								THESIS/ORAL	THESIS/ORAL	THESIS/ORAL	THESIS/ORAL
19								PROJECT/ORAL/IPROJ	PROJECT/ORAL/IPROJ	PROJECT/ORAL/IPROJ	PROJECT/ORAL/ORAL/IPROJ
20	ICW	ICW	ICW	ICW	ICW	ICW					

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	**Modules Covered**	**Assessment**	
		Type	Weight (%)
N/A			

9. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who provides authoritative guidance on policy and

procedure to the Panel. Proposals are reviewed in line with the UK Quality Code for Higher Education. New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guiding principles to meet the Expectations and Core Practices of the UK Quality Code for Higher Education. External examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the UK Quality Code for Higher Education. The delivery of new partnership provision is ultimately approved by the Universities Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

10. <u>What opportunities are graduates likely to have on completing the course?</u>

This course provides the advanced academic background necessary to contribute effectively to technically demanding projects in the field of explosives and explosives ordnance engineering. Accordingly, opportunities exist for the armed services, defence industry, government servants and civilians in areas spanning: explosive synthesis; manufacture and quality assurance; security; risk, hazard and safety; explosive related forensics; terrorism; demolition; environmental; nuclear materials; fireworks and display; rocket/gun propellants and weapon design, together with explosives related academic disciplines.

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COURSE SPECIFICATION

Cranfield University: Course Specifications
Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

Date of first publication/latest revision: June 2024

1. What is the course?

Course information

Course Title	MSc Finance
Course code	MSFCEFTC, PDFCEFTC, PCFCEFTC
Academic Year	2023/24
Valid entry routes	MSc
Additional exit routes	PgDip and PgCert
Mode of delivery	Full-time,
Location(s)[1] of Study	Cranfield Campus
School(s)	School of Management
Theme	Leadership and Management
Centre	Finance and Economics
Course Director	Dr Nemanja Radić;
Awarding Body	Cranfield University
Is this an AP Contract course?[2]	No
Is this course offered as a Cranfield Mastership?	No
Apprenticeship Standard the course is mapped to	N/A
Is the Degree apprenticeship integrated or non-integrated?	N/A
Is the Mastership offered as an open and/or closed course?	N/A
Teaching Institution	Cranfield University

[1] If any part of this course is delivered at another site, please note which one(s) here
[2] AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Admissions body	Cranfield University
Entry requirements	Equivalent of a UK 2.1 degree or with at least 5 years of relevant experience
UK Qualifications Framework Level	QAA FHEQ level 7 (Masters)
Benchmark Statement(s)	N/A
Registration Period(s) available	Full-time MSc – one year
Course Start Month(s)	September

Institutions delivering the course

This course is primarily be delivered by Finance and Accounting group in School of Management. The course has 100 credits on core modules and 20 credits via electives.

Cranfield University interacts with the following institutions and in the following ways:

- Teaching/instruction from external academic, industry and other guest speakers
- Individual thesis

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

The Chartered Financial Analyst (CFA) Institute University Affiliation Program provides an approved route to work towards an additional professional qualification.

2. What are the aims of the course?

Cranfield University offers this course in order to:

- To prepare students for a career in financial services and investment industry
- To provide students with a high level of financial skills
- To give students a rounded view of business and understanding of the investment sector

This programme is intended for the following range of students:

- Students with good numerate skills
- Young students seeking to develop their understanding of Finance
- Students seeking to work in finance-related services

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate

In completing this course, and achieving the associated award, a diligent student should be able to:

ILO 1. Appraise key finance and investment issues.
ILO 2. Interpret and apply financial information effectively.

ILO 3. Demonstrate ability to creatively apply firm valuation and financial modelling in practical decision making.

B. Postgraduate Diploma

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

ILO 4. Critically assess current research in finance and investment together with the capacity to evaluate its relevance to practice.
ILO 5. Use their conceptual understanding to evaluate contemporary issues and methods for financial analysis and, where appropriate, adapt them in the context of both advanced scholarship and their selected specialisms.
ILO 6. Acquire and use information effectively in any appropriate medium, including using the range of analytical tools for investment decision making.
ILO 7. Advance their knowledge and develop new financial skills to a high level.
ILO 8. Apply financial and investment management theories, tools, and techniques in a variety of contexts including case studies, trading simulations and the individual thesis project.

C. MSc

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

ILO 9. Evaluate appropriate theoretical frameworks for an issue or situation under consideration and to apply the technique(s) correctly.
ILO 10. Display practical capabilities in self-directed research, data gathering, data analysis and interpretation, report writing and presentation skills.
ILO 11. Carry out research using appropriate techniques and draw justifiable inferences from the data obtained.
ILO 12. Critically evaluate and synthesis the published literature in finance and investment.
ILO 13. Produce a high-quality thesis and critically evaluate the interpretations of the data.

4. How is the course taught?

Overall, the aim is to provide a varied, stimulating, and experiential learning environment. All taught modules consist of formal lectures, in-class discussions, group, and self-study. Group project work, reflective practice and class exercises are used to develop problem solving skills. The course will be supported by an electronic learning environment (VLE - Canvas) which will be the central repository for all information always relating to the course and available to the students. This will be supplemented by online module case packs. Additional practical expertise will be provided by visiting fellows and guest speakers. Each core module comprises 20 hours of class contact time with a further 80 hours of study time to consolidate learning and carry out assignments, giving 100 notional learning hours per module. Each elective module also has 100 notional hours consisting of 20 class contact hours and a further 80 private study hours. The thesis component of the module is a total of 80 credits.

Students will be supported in their learning and personal development by:

- Lectures
- Group work and presentations
- Modelling and programming
- Research-based thesis

Programming and modelling enable students to access important databases on companies and capital markets and use the necessary software programmes for carrying out modelling. Simulated games give students a realistic view of how negotiations are carried in corporate transactions and how decisions affect firm value.

In addition to the teaching methods outlined above, students are supported in their learning and personal development by:

- Personal development lectures delivered by the Head of the Career Development Service
- Help with preparation of CVs
- Help through mock interviews

Students will be supported in their learning and personal development by:

- Two-week orientation program in accounting, finance and statistics aimed at students with quantitative background but have little or no prior background in accounting and finance and statistics
- Library induction, referencing and plagiarism sessions
- PDP specifically supported through SOM careers development sessions
- Organisation Behaviour and Personal Development module
- A Virtual Learning Environment
- Learning teams supported by an academic tutor

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 8. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

Finance

A. Postgraduate Certificate

The accumulation of 60 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Any 6 core modules from 1-10	60
ELECTIVE MODULES:	
TOTAL:	60

B. Postgraduate Diploma

The accumulation of 120 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	

All modules from 1-10.	100
ELECTIVE MODULES:	
2 modules from 11-15.	20
TOTAL:	120

C. MSc

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	**Credits**
COMPULSORY MODULES:	
All modules 1-10. 16 Thesis	100 80
ELECTIVE MODULES:	
2 modules from 11-15.	20
TOTAL:	200

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of ≥50%;
- An average mark of ≥50% across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee); [3]
- **For Taught Assessments,** the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
  - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of ≥50% across the taught assessments);
  - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
  - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.

[3] Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of <40% (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award (<50%).

- **For Substantial pieces of assessment** (corresponding to ≥40 credits, which are not part of the taught assessment average), the pass mark of ≥50% (where they exist);
- **For the thesis,** a mark of ≥50% in order to receive a pass (where it exists).

6. How is the course structured?

Full-time students register for the course in September and are expected to complete the course within 12 calendar months.

The core and elective modules (two out of five modules) will be taught in a series of 10x2 hour lectures in the terms one and two. The individual research-based thesis is undertaken during terms 3 and 4.

7. Course Level Assessment Strategy[4]

The aim is to provide a varied, stimulating, and experiential learning environment. All taught modules consist of formal lecturers, in-class case discussions, group, and self-study. Group project work, reflective practice and class exercises are used to develop problem solving skills.

The course further aims to offer personal and specialist skills development for candidates with extensive industrial experience.

The assessment strategy of this course is challenging and diverse and enable students to demonstrate a full range of skills and attributes. The overall course assessment strategy is performed via following ratio: taught modules 60% and dissertation 40%. For the most part the assessments on the course are done via exams (up to 60% of the taught modules part). This is done so that we can better capture quantitative nature of our modules and to provide real life preparation for further professional CFA accreditation that is also done by examination.

Summative assessment will include a range of assessment types including the preparation of individual and group reports and written exams.

This approach has been adopted in order to ensure that students demonstrate their understanding through a wide range of learning techniques but are not disadvantaged through any one approach.

Written coursework will be of varying lengths, recognising that writing coursework to a short length can be more challenging for some and can develop different skills relevant to professional practice. The length of each assessment task is usually stated within the module descriptor. Students then have opportunities to develop their communication and group working skills, as they are required to give group presentations. Feedback for all assessments is given in a timely fashion, dependent on the type of assessment, but always within 20 working days of submission deadline.

A number of modules (and especially electives) are supported by a number of formative tasks including group discussion, case studies, oral presentations. Formative feedback will be provided through in-class discussion on the conceptual material introduced during each session.

The taught components precede the research project, so assessment can be used to develop skills required for the individual research project. Students are generally expected to be more self-directed in their learning during this research project and guidance will be provided through the [*Applied Research Methods in Finance* module] and meetings with their thesis supervisor.

[4] Guidance to aid colleagues writing or updating a course-level assessment strategy for inclusion in the Course Specification can be found as Appendix K in either the Senate Handbook on Setting up a New Taught Course or the Senate Handbook on Managing Taught Courses https://intranet.cranfield.ac.uk/EducationServices/Pages/SenateHandbooksA-Z.aspx

Course modules
MSc Finance

Module occ A

The following modules outline all parts of the programme leading to **MSc**. Other awards associated with the course include some or all of these modules.

Module Number		Module code	Title	Module Leader	Contact hours[5]	Total hours delivered by Visiting Lecturers[6]	Credits	Is the module shared? Y/N	Calendar			Assessment							
													Independent Assessment		Multi-part Assessment			Submission dates	
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[7] - 40% or 50%	Type of Assessment	Weighting within module[8] (%) of Independent	Weighting within module of multi-part assessments [9](100%)	Type of Assessment	Weighting of individual elements of multi-part assessment[10]	Assessment Submission and/or exam date[11]	Assessment / Exam Retake date
0		M-T/IND	SOM MSc Induction	Dr Nemanja Radić	30	20		Y	25/09/2023	02/10/2023	02/10/2023	n/a	AO						
1		M-F/COF-A23	Corporate Finance	Prof. Yacine Belghitar	20		10	Y	25/09/2023	02/10/2023	08/11/2023	40	EX	100				December 23 /January 24	June 24 (TBC)
2		M-F/SAF	Statistical saAnalysis in Finance	Dr Nemanja Radić	20		10	N	25/09/2023	02/10/2023	08/11/2023	40	EX	100				December 22 /January 23	June 24 (TBC)

[5] Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice
[6] Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)
[7] A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.
[8] For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education
[9] For **multi-part assessments** please record the overall weighting of module which should be 100%. Multipart assessments should only be included in courses where there is a clear androgogical reason and where each element forms part of a continuous learning and assessment experience for students.
[10] Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate*).* If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.
[11] Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Module Number		Module code	Title	Module Leader	Contact hours[5]	Total hours delivered by Visiting Lecturers[6]	Credits	Is the module shared? Y/N	Calendar			Assessment							
													Independent Assessment		Multi-part Assessment			Submission dates	
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[7] - 40% or 50%	Type of Assessment	Weighting within module[8] (%) of Independent	Weighting within module of multi-part assessments [9](100%)	Type of Assessment	Weighting of individual elements of multi-part assessment[10]	Assessment Submission and/or exam date[11]	Assessment / Exam Retake date
3		M-F/ACC	Accounting	Dr Matthias Nnadi	20		10	N	25/09/2023	03/11/2023	28/11/2023	40	EX	100				December 22 /January 23	June 24 (TBC)
4		M-F/ECO	Economics for Financial Markets	Prof. Constantinos Alexiou	20		10	N	25/09/2023	03/10/2023	31/10/2023	40	EX	100				December 23 /January 24	June 24 (TBC)
5		M-F/ IFME-A23	International Financial Markets and Ethics	Dr Nemanja Radić Dr Walter Gontarek	20	20	10	Y	04/10/2023	04/10/2023	06/11/2023	40	GCW	100				19/01/2024	TBC
6		M-F/IES	Investing for Environmental and Social Impact	Dr Emmeline Cooper	20	20	10	N	09/11/2023	09/11/2023	29/11/2023	40	GPRES	100				12/01/2024	TBC
7		M-F/VFM	Valuation and Financial Modelling	Dr Vineet Agarwal	20		10	N	08/01/2024	08/01/2024	07/02/2024	40	EX	100				April/ May 24	June 24 (TBC)
8		M-F/ARMF	Applied Research Methods in Finance	Dr Vineet Agarwal	20		10	N	08/01/2024	08/01/2024	07/02/2024	40	GCW	100				09/05/2024	TBC
9		M-F/IPM	Investment and Portfolio Management	Prof. Sunil Poshakwale/	20		10	N	09/01/2024	09/01/2024	08/02/2024	40	EX	100				April/ May 24	June 24 (TBC)
10		M-F/DFRM	Derivatives and Financial Risk Management	Dr Peter Yallup	20		10	N	09/01/2024	09/01/2024	08/02/2024	40	EX	100				April/ May 24	June 24 (TBC)
11		M-F/PEQ	Private Equity	Dr Wasim Ahmad	20		10	Y	12/02/2024	12/02/2024	13/03/2024	40	ICW	100				12/04/2024	TBC

Module Number		Module code	Title	Module Leader	Contact hours[5]	Total hours delivered by Visiting Lecturers[6]	Credits	Is the module shared? Y/N	Calendar			Assessment							
													Independent Assessment		Multi-part Assessment			Submission dates	
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[7] - 40% or 50%	Type of Assessment	Weighting within module[8] (%) of Independent	Weighting within module of multi-part assessments [9](100%)	Type of Assessment	Weighting of individual elements of multi-part assessment[10]	Assessment Submission and/or exam date[11]	Assessment / Exam Retake date
12		M-F/MAR	Mergers, Acquisitions and Restructuring	Prof. Yacine Belghitar Prof. Andrea Moro	20		10	Y	13/02/2024	13/02/2024	14/03/2024	40	GPRES	100				09/04/2024	TBC
13		M-F/FIS	Fixed Interest Securities and Credit Risk Modelling	Dr Vineet Agarwal	20		10	Y	12/02/2024	12/02/2024	18/03/2024	40	ICW	100				12/04/2024	June 24 (TBC)
14		M-F/FSS	FinTech, Start-Ups and Small Business Finance	Prof. Andrea Moro	20		10	N	NOT RUNNING AY 23-24	N/A	N/A	40	GPRES	100				N/A	N/A
15		M-E/ENF-23-B23	Entrepreneurial Finance	Prof. Steffi Hussels	20		10	Y	12/02/2024	12/02/2024	15/03/2024	40	GCW	100				02/04/2024	
16		M-F/IEM	Investing in Emerging Markets and Alternative Investments	Prof. Sunil Poshakwale	20		10	Y	16/02/2024	16/02/2024	15/03/2024	40	ICW	100				12/04/2024	TBC
16		M-F/THS	Thesis	Dr Nemanja Radić	50		80	Y		June 24 (TBC)		50	THESIS	100				02/09/2024	TBC

Please list all modules that are used by another existing course.

Module code	**Module title**	**Module Type**	**Course that owns the module**	**Other course(s)/ programme(s) that use the module**
M-T/IND	SOM MSc Induction Week	Compulsory	MSc Management	MCS, MENT, SM, AFI, LSCM, PSCM, PGC
M-F/COF	Corporate Finance	Compulsory	MSc Finance	MSc Accounting and Finance
M-F/IFME	International Financial Markets and Ethics	Compulsory	MSc Finance	MSc Accounting and Finance
M-F/PEQ	Private Equity	Elective	MSc Finance	MSc Accounting and Finance
M-F/MAR	Mergers, Acquisitions and Restructuring	Elective	MSc Finance	MSc Accounting and Finance
M-F/IEM	Investing in Emerging Markets and Alternative Investment	Elective	MSc Finance	MSc Accounting and Finance
M-F/FIS	Fixed Interest Securities and Credit Risk Modelling	Elective	MSc Finance	MSc Accounting and Finance
M-AF/INF	International Finance	Elective	MSc Accounting and Finance	MSc Finance
M-AF/IPFT	International Public Finance and Taxation	Elective	MSc Accounting and Finance	MSc Finance
M-E/ENF	Entrepreneurial Finance	Elective	MSc Management and Entrepreneurship	MSc Finance MSc Accounting and Finance
M-F/THS	Thesis	Compulsory	MSc Finance	MSc Accounting and Finance

8. How are the ILOs assessed?

The course uses a range of assessment types. Students can expect to have written examinations, pieces of assessment by submitted coursework and elements of assessment by presentation. This approach has been adopted to give the opportunity for students to learn in groups and develop their soft skills such as negotiation strategy and effective presentation.

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

(Module numbers should correspond with those used in the Course module table above.)

Award ILOs / Module No.	**ILO1**	**ILO2**	**ILO3**	**ILO4**	**ILO5**	**ILO6**	**ILO7**	**ILO8**	**ILO9**	**ILO10**	**ILO11**	**ILO12**	**ILO13**
	Postgraduate Certificate			**Postgraduate Diploma**					**MSc**				
1	EX	EX	EX			EX		EX					
2	EX	EX	EX	EX		EX							

Award ILOs / Module No.	ILO1	ILO2	ILO3	ILO4	ILO5	ILO6	ILO7	ILO8	ILO9	ILO10	ILO11	ILO12	ILO13
3	EX	EX	EX		EX								
4	EX	EX		EX									
5	GCW	GCW		GCW									
6	GPRES		GPRES	GPRES				GPRES					
7	EX	EX	EX			EX		EX					
8	GCW	GCW		GCW		GCW						GCW	
9	EX	EX	EX			EX		EX					
10	EX	EX	EX			EX							
11			ICW	ICW	ICW		ICW						
12			GPRES	GPRES	GPRES		GPRES						
13				ICW	ICW		ICW						
14			GPRES	GPRES	GPRES		GPRES						
15				ICW	ICW		ICW						
16				THS				THS	THS	THS	THS	THS	THS

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	Modules Covered	Assessment	
		Type	Weight (%)
N/A	N/A	N/A	N/A
		N/A	N/A

9. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who provides authoritative guidance on policy and procedure to the Panel. Proposals are reviewed in line with the UK Quality Code for Higher Education. New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.
The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6-year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guiding principles to meet the Expectations and Core Practices of the UK Quality Code for Higher Education. External examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition, students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the UK Quality Code for Higher Education. The delivery of new partnership provision is ultimately approved by the Universities Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5-year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

10. What opportunities are graduates likely to have on completing the course?

Almost all our graduates for whom we have career data work in financial institutions or consultancies specialising in financial services.

A large number of our students have joined prestigious financial service organisations including investment banks, private equity firms, stockbrokers, financial consultancies, commercial banks and various multinational corporations.

COURSE SPECIFICATION

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

Date of first publication/latest revision: June 2024

1. What is the course?

Course information

Course Title	Flight Test and Flight Dynamics
Course code	MSFFDPTC, PDFFDPTC, PCFFDPTC
Academic Year	2023-24
Valid entry routes	MSc, PGCert
Additional exit routes	PGDip
Mode of delivery	Part-time
Location(s)[1] of Study	Cranfield University, Cranfield Empire Test Pilots' School, MOD Boscombe Down
School(s)	School of Aerospace, Transport and Manufacturing (SATM)
Theme	Aerospace
Centre	Centre for Aeronautics
Course Director	Dr James Whidborne
Awarding Body	Cranfield University
Is this an AP Contract course?[2]	No
Is this course offered as a Cranfield Mastership?	No
Apprenticeship Standard the course is mapped to	n/a
Is the Degree apprenticeship integrated or non-integrated?	n/a
Is the Mastership offered as an open and/or closed course?	n/a

[1] If any part of this course is delivered at another site, please note which one(s) here
[2] AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Teaching Institution	Cranfield University Empire Test Pilots' School
Admissions body	Cranfield University
Entry requirements	Standard university entry requirement, successful completion of preparatory work (APL) and continued study on an assessed flight test course carried out by the Empire Test Pilot's School.
UK Qualifications Framework Level	QAA FHEQ Level 7 (Masters)
Benchmark Statement(s)	None
Registration Period(s) available	2 years
Course Start Month(s)	August

Institutions delivering the course

This course is delivered by SATM/Aerospace/Centre for Aeronautics where the research interests include:

Flight dynamics; aircraft stability, control and handling qualities and flight control system design

Cranfield University interacts with the following institutions and in the following ways:

Teaching and assessment is also provided by the Empire Test Pilots' School (ETPS), MoD Boscombe Down. The assessment materials are subject to the same scrutiny procedures as the CU elements which are all contained within the 'parallel' MSc course in Aerospace Dynamics.

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This course is not accredited by any external bodies.

What are the aims of the course?

Cranfield University offers this course to enable test pilot and flight test engineer 'graduates' gain a more rigorous understanding of the concepts and theories underpinning flight test and experimental flight dynamics. The Postgraduate Certificate (PGCert) entry route is provided for students who wish to access only the parts of the course delivered at ETPS.

This programme is intended for the following range of students:

Test pilot and flight test engineer students studying with ETPS. Consequently it is closed to all other applicants

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate

In completing this course, and achieving the associated award, a diligent student should be able to:

ILO 1. Create a simplified mathematical model of an aircraft suitable for flight dynamics analysis.

ILO 2. Undertake critical analyses of performance, stability and control flight test results.
ILO 3. Identify the principles that constrain design solutions to specification non-compliance.
ILO 4. Design, plan and execute flight test programmes to obtain the data necessary to construct an aerodynamic model of an aircraft.
ILO 5. Design, plan, execute and report on flight test programmes undertaken to evaluate aircraft and installed system compliance with flying qualities requirements.
ILO 6. Describe and analyse the linear dynamics and stability of aircraft..

B. Postgraduate Diploma

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

ILO 7. Evaluate, analyse and design flight control systems
ILO 8. Propose solutions to handling qualities specification non-compliance.

C. Masters of Science

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

ILO 9. Define and justify a research project by reference to, and critical assessment of, the scientific, technical and/or commercial literature. Plan, manage and report the results in a clear manner.
ILO 10. Analyse the work, relate it to the work of others and be self-critical. Communicate the work, the results and its analysis in a technically sound and well-presented document.

4. How is the course taught?

The course is taught in two phases: the first takes place at ETPS, MoD Boscombe Down and the second at Cranfield University.

The teaching and learning at ETPS takes place within the appropriate (FW or RW) class A course defined in the latest version of QinetiQ/AS/ETPS/GRADUATE COUSE SYLLABI. These courses equip individuals to operate as test pilots or flight test engineers within the international military and/or civilian flight test community. For the purposes of defining this course the teaching at ETPS has been considered as a series of themes from which elements have been identified and 'mapped' across to equivalent modules in the MSc in Aerospace Dynamics delivered entirely by Cranfield University, see Section 6.

The teaching and assessment of major elements of the Graduate Course Syllabus is achieved by the following process:

- Academic instruction delivered by Flight Dynamics tutors (who are awarded RTS status by the University). This instruction is designed to ensure sound knowledge of the theory.
- A 'Test Methods Brief' delivered by either a test pilot, or flight test engineer (FTE), tutor that concentrates on the practical aspects of planning, conducting and reporting on an aspect of testing.
- An 'Exercise Sortie Brief' that covers the details of the exercise that constitutes the assessment for the topic.
- A tutorial session designed to foster discussion of the topic in small groups or on an individual basis.
- A demonstration flight during which the practical aspects of test conduct are rehearsed. The performance of the student is assessed and used to gauge understanding of the subject.
- Solo or mutual exercise flight(s).
- A reporting 'action' in the form an oral debrief, presentation, committee meeting or written report.
- Grading as described in latest version of QINETIQ/MS/AD/TM1602073 .
- Formal debrief in which the reporting 'activity' is discussed in detail with the assessing tutor.

Although the aeronautics theme permeates much of what is taught at ETPS its assessment is not readily identifiable for mapping purposes. Equally the academic rigour with which this topic is applied within the reporting actions listed above is not sufficient for an M-level qualification. Consequently assessment is made by means of an examination entitled the 'Fundamentals of Aeronautics' that falls outside the Graduate course assessment scheme.

The flight dynamics theme within the Graduate course has a direct parallel with the Flight Dynamics Principles module taught in the Aerospace Dynamics MSc, see Section 6. As such it is assessed by means of a similar assignment to that used at Cranfield and is subject to the same 'approval' process as assessments generated for the Aerospace Dynamics MSc. The Flight Dynamics assignment falls outside the Graduate course assessment scheme.

As control engineering is not covered to sufficient depth it is presented at the conclusion of the Graduate course prior to students transferring to Cranfield University. This module, which has an equivalent on the MSc in Aerospace Dynamics, is delivered in the more traditional manner by means of lectures and assessed using an examination and an assignment. Both of which are subject to the same approval' process as assessments generated for the Aerospace Dynamics MSc.

The balance of the taught element of the MSc course is delivered at Cranfield University on a full time basis by means of modules offered from within the MSc in Aerospace Dynamics. Depending on the module selected teaching and learning is achieved by means of lectures and laboratory exercises whilst the assessment is made using an examination or an assignment.

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 8. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. Postgraduate Certificate

The accumulation of 60 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Modules A, 1 & 2	60
ELECTIVE MODULES:	
None	0
TOTAL:	60

B. Postgraduate Diploma

The accumulation of 120 credits (or more) through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Modules A and 1-4	80
ELECTIVE MODULES:	
A total of 40 credits taken from modules 5-9	40

TOTAL:	120

C. MSc

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	**Credits**
COMPULSORY MODULES:	
Modules A, 1-4 Module 10	80 80
ELECTIVE MODULES:	
A total of 40 credits taken from modules 5-9	40
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of ≥50%;
- An average mark of ≥50% across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee); [3]
- **For Taught Assessments,** the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
  - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of ≥50% across the taught assessments);
  - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
  - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥40 credits, which are not part of the taught assessment average), the pass mark of ≥50% (where they exist);
- **For the thesis,** a mark of ≥50% in order to receive a pass (where it exists).

[3] Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of <40% (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award (<50%).

6. How is the course structured?

Students register for the course in August and gain accreditation for the learning that is encompassed by the module entitled `Fundamentals of Aeronautics and Flight test'. They are then expected to complete the PGCert course modules at ETPS by December. Students on the MSc entry route will then attend the Control Engineering module at ETPS in early January before transferring to Cranfield University to complete the taught element. All modules that are available for this course, and delivered at Cranfield University, form part of the existing provision for the MSc in Aerospace Dynamics.

The taught element of the course is completed by the end of the second teaching period at Cranfield, typically by May. For those studying for the MSc the remaining time, until end of July of the following year, is set aside for completion of the individual research project on a part-time basis.

Students who do not submit a thesis on time, without an approved extension, will fail the MSc and be offered the award of PGDip as credit for successful completion of the taught element of the course.

7. Course Level Assessment Strategy[4]

The assessment tasks are challenging and enable students to demonstrate a full range of skills and attributes relevant to their intended future flight test careers. The initial module [N-FD-FOA] will introduce students to aspects of aircraft performance, stability and control and systems and will be assessed through individual flight test reports and through an examination. The reports will be on varying topics, recognising the need for test professionals to develop critical thinking, analysis and reporting skills over a broad spectrum of topics and providing the opportunity to practice and develop these skills. The objectives for testing, report construction and relevant specification compliance analysis is clearly stated within the exercise briefing packs and. Feedback on the reports is provided by the instructional staff in written format and through verbal de-briefs. The students understanding of aircraft performance, stability and control theory will be assessed primarily through examination. For the module [N-FD-FDP] students are provided with the opportunity to undertake an assessment of an aircraft stability and control problem to put into practice their skills acquired through classroom instruction. The assignment provides the opportunity to develop and critique the characteristics of an example aircraft and to generate a report detailing their findings. Feedback is provided in written format and through individual verbal de-briefing. The final module undertaken at ETPS [N-FD-CPT] provides the students the opportunity to demonstrate the skills acquired through the course with a final flight test exercise on an unfamiliar aircraft type. The objectives for the flight test "preview" are provided by the instructional staff but the overall test planning, conduct and reporting is undertaken as a group exercise. Working together in a group is an important asset of a flight test professional and the students will be expected to demonstrate this important aspect in all phases of this module. Although a group exercise, each student will be expected to submit an individual report which will be assessed by the instructional staff with written feedback provided. Understanding will also be assessed through individual Viva.

For the PGDip/MSc modules, the assessments are designed to ensure that the Intended Learning Outcomes are achieved. For [N-FD-CEM], the summative assessments include an examination to ensure that learners have a sound understanding of the underlying principles, and an assessed assignment that ensures the ILOs relating to the application of the methods to practical problems are achieved. For the remaining modules undertaken at Cranfield, the assessments for each module are summative, with non-assessed formative feedback provided during the module by a wide variety of mechanisms, including tutorial questions, lab exercises, class discussions, quizzes etc. A summative assessment may be a closed-book examination or individual course work that is assessed via an assignment report. The choice of the assessment depends on the nature of the material, with fundamental principles more likely to be tested by examination and applications by assignment at a typical level in industry.
For [N-FD-IRP], the individual research project, the project is assessed by a summative research report, delivered at the end of the project.

[4] Guidance to aid colleagues writing or updating a course-level assessment strategy for inclusion in the Course Specification can be found as Appendix K in either the Senate Handbook on Setting up a New Taught Course or the Senate Handbook on Managing Taught Courses https://intranet.cranfield.ac.uk/EducationServices/Pages/SenateHandbooksA-Z.aspx

Course modules

The following modules outline all parts of the programme leading to **MSc.** Other awards associated with the course include some or all of these modules.

Module Number	Module code	Title	Module Leader	Contact hours[5]	Total hours delivered by Visiting Lecturers[6]	Credits	Is the module shared? Y/N	Calendar			Assessment								
												Independent Assessment		Multi-part Assessment			Submission dates		
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[7] - 40% or 50%	Type of Assessment	Weighting within module[8] (%) of Independent	Weighting within module of multi-part assessments[9] (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment[10]	Assessment Submission and/or exam date[11]	Assessment / Exam Retake date
A	N-FD-FOA Occ B	Fundamentals of Aeronautics & Flight Test	Derek Rodger (ETPS)	80	80	30	N	10/01/23	10/01/23	12/05/23	50	EX ICW1 ICW2	66 17 17				05/07/23	N/A
1	N-FD-FDP	Flight Dynamics Principles for Flight Test	Derek Rodger (ETPS)	26	26	10	N	15/08/23	15/08/23	31/08/23	40	ICW	100				14/10/23	N/A
2	N-FD-CPT	Capstone	Derek Rodger	30	30	20	N	01/11/23	01/11/23	04/11/23	50	GCW	100				11/12/23	N/A

[5] Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice
[6] Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)
[7] A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.
[8] For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education
[9] For **multi-part assessments** please record the overall weighting of module which should be 100%. Multipart assessments should only be included in courses where there is a clear androgogical reason and where each element forms part of a continuous learning and assessment experience for students.
[10] Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate*).* If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.
[11] Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours[5]	Total hours delivered by Visiting Lecturers [6]	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[7] - 40% or 50%	Type of Assessment	Weighting within module[8] (%) of Independent	Weighting within module of multi-part assessments [9](100%)	Type of Assessment	Weighting of individual elements of multi-part assessment[10]	Assessment Submission and/or exam date[11]	Assessment / Exam Retake date
		Flight Testing	(ETPS)															
3	N-FD-CEM	Control Engineering	Derek Rodger (ETPS)	35	5	**10**	N	15/08/23	15/08/23	05/01/24	40	ICW	100				16/02/24	At the next available opportunity which may not be until the course runs the following year
4	N-ASD-FQAFC	Flying Qualities & Flight Control	Dr Mushfiqul Alam (CU)	28	0	**10**	Y	22/01/24	22/01/24	26/01/24	50	ICW	100				26/04/24	At the next available opportunit y which may not be until the course runs the following year.
5	N-ASD-MVCAA	Multivariable Control Systems for Aerospace Applications	James Whidborne (CU)	30	0	10	Y	05/02/24	05/02/24	09/02/24	50	ICW	100				15/03/24	At the next available opportunit y which may not be until

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours[5]	Total hours delivered by Visiting Lecturers [6]	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[7] - 40% or 50%	Type of Assessment	Weighting within module[8] (%) of Independent	Weighting within module of multi-part assessments [9](100%)	Type of Assessment	Weighting of individual elements of multi-part assessment[10]	Assessment Submission and/or exam date[11]	Assessment / Exam Retake date
																		the course runs the following year.
6	N-ASD-AMS	Air-Vehicle Modelling and Simulation	Dr Linghai Lu (CU)	28	0	10	Y	08/01/24	08/01/24	12/01/24	50	ICW	100				23/02/24	At the next available opportunity which may not be until the course runs the following year.
7	N-ASE-GPS	Aerospace Navigation & Sensors	Dr L Felicetti (CU)	24	0	10	Y	19/02/24	19/02/24	01/03/24	40	ICW	100				12/04/24	At the next available opportunity which may not be until the course runs the following year.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours[5]	Total hours delivered by Visiting Lecturers [6]	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[7] - 40% or 50%	Type of Assessment	Weighting within module[8] (%) of Independent	Weighting within module of multi-part assessments [9](100%)	Type of Assessment	Weighting of individual elements of multi-part assessment[10]	Assessment Submission and/or exam date[11]	Assessment / Exam Retake date
8	N-ASD-FASD	Fundamentals of Aircraft System Identification	Dr Linghai Lu (CU)	30	0	10	Y	11/03/24	11/03/24	15/03/24	50	ICW	100				26/04/24	At the next available opportunity which may not be until the course runs the following year.
9	N-ASD-FRPS	Fundamentals of Rotorcraft Performance Stability and Control	Dr Linghai Lu (CU)	30	0	10	Y	12/02/24	12/02/24	16/02/24	50	EX	100				EXAM WEEK 4	At the next available opportunity which may not be until the course runs the following year
10	N-FD-IRP	Individual Research Project	Dr James Whidborne (CU)	10	0	80	N	28/06/24	28/06/24	31/07/25	50	100	THESIS				31/07/25	N/A

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Please list all modules that are used by another existing course.

Module code	**Module title**	**Course that owns the module**	**Other course(s)/ programme(s) that use the module**
N-ASD-FQAFC	Flying Qualities and Flight Control	Aerospace Dynamics	Flight Test and Flight Dynamics
N-ASD-MVCAA	Multivariable Control Systems for Aerospace Applications	Aerospace Dynamics	Flight Test and Flight Dynamics
N-ASD-AMS	Air Vehicle Modelling and Simulation	Aerospace Dynamics	Flight Test and Flight Dynamics
N-ASD-FASD	Fundamentals of Aircraft System Identification	Aerospace Dynamics	Flight Test and Flight Dynamics
N-ASD-FRPS	Fundamentals of Rotorcraft Performance Stability and Control	Aerospace Dynamics	Flight Test and Flight Dynamics
N-ASE-GPS	Aerospace Navigation and Sensors	Astronautics and Space Engineering	Flight Test and Flight Dynamics Aerospace Dynamics

8. How are the ILOs assessed?

The following assessment types are utilised:

The course uses a range of assessment types. All exit routes require students to submit two flight test reports and the Capstone report which have been assessed and graded as part of the Graduate course.

In addition students studying for the PGCert can expect to have one written examination and one piece of assessment by submitted work (assignment).

For those on the MSc entry route a further one to three written examinations and two to three assignments are required depending on the electives chosen.

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

(Module numbers should correspond with those used in the Course module table above.)

A. Postgraduate Certificate

Award ILOs / **Module No.**	ILO 1	ILO 2	ILO 3	ILO 4	ILO 5	ILO 6
A		APL	APL	APL		
1	ICW					ICW
2			GCW		GCW	

B. Postgraduate Diploma

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs / Module No.	ILO 7	ILO 8			
3	ICW				
4		ICW			
5	ICW	ICW			
6	ICW				
7	ICW				
8	EX				
9	EX	EX			

C. Master of Science

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs / Module No.	ILO 9	ILO 10
10	THESIS	THESIS

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	Modules Covered	Assessment	
		Type	Weight (%)

9. How will the University assure the quality of the provision?

The quality of provision is assured by two separate but complementary mechanisms depending on where the delivery is taking place.

A. Empire Test Pilots' School

As the teaching and learning for modules 1 and 2 takes place at ETPS and can be related to elements within the Graduate course quality assurance is provided by the mechanisms described below. Quality assurance for modules 1 and 3 is also achieved by means of the mechanisms in place for the MSc in Aerospace Dynamics described in Section B below.

At the end of each exercise there is a 'wash-up' supervised by the exercise tutor and focussing on the outcomes from the whole exercise. This is the primary feedback mechanism used to elicit the views of the students on the effectiveness of individual exercises from their perspective. By the time the 'wash-up' session is held, students have received individual or team feedback from the assessing tutors on their own performance and the group session enables lessons learned by all to be shared. The session also provides for suggestions for improvements in the exercise to be noted for inclusion in future exercises and/or future years. Other opportunities for students to provide feedback on the course delivery and assessment are

provided at the end of the first and second terms and/or at the end of the initial class B courses (at the mid-point of the ETPS year). There is a final opportunity for feedback at the end of the ETPS year, coinciding with the end of the class A course. Responsibility for acting on student feedback is initially that of the principal tutors with the Head of Training (HoT ETPS) and the Commanding Officer ETPS (CO ETPS) invariably taking a keen interest in the outcomes from the student feedback and the actions arising

B. Cranfield University

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guidance provided by the QAA particularly in Chapter B7 (External Examining) which emphasises that external examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

10. What opportunities are graduates likely to have on completing the course?

enter text here

COURSE SPECIFICATION

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

Date of first publication/latest revision: June 2024

1. What is the course?

Course information

Course Title	Food Systems and Management
Course code	MSFSMFTC, MSFSMPTC, PDFSMFTC, PDFSMPTC, PCFSMFTC, PCFSMPTC
Academic Year	2023/24
Valid entry routes	MSc, PgDip, PgCert
Additional exit routes	PgDip, PgCert
Mode of delivery	Full-time, Part-time
Location(s)[1] of Study	Cranfield
School(s)	School of Water, Energy and Environment
Theme	Environment & Agrifood
Centre	Soil, Agrifood and Biosciences (SABS)
Course Director	Dr Carmen Alamar Gavidia
Awarding Body	Cranfield University
Is this an AP Contract course?[2]	No
Is this course offered as a Cranfield Mastership?	No
Apprenticeship Standard the course is mapped to	N/A
Is the Degree apprenticeship integrated or non-integrated?	N/A
Is the Mastership offered as an open and/or closed course?	N/A

[1] If any part of this course is delivered at another site, please note which one(s) here
[2] AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Teaching Institution	Cranfield University.
Admissions body	Cranfield University
Entry requirements	1st or 2nd class UK honours degree or equivalent; in a science or engineering subject Candidates with other qualifications will be considered according to experience Where applicable minimum IELTS score of 6.5 or TOEFL 580
UK Qualifications Framework Level	QAA FHEQ Level 7 (Masters)
Benchmark Statement(s)	N/A
Registration Period(s) available	Full-time MSc - one year, Part-time MSc - up to three years, Full-time PgCert - one year, Part-time PgCert - two years, Full-time PgDip - one year, Part-time PgDip - two years
Course Start Month(s)	Full Time: October Part-time: throughout the year (October preferred, other times on case by case basis)

Institutions delivering the course

This course is delivered by the Cranfield Soil,Agrifood and Biosciences Institute and the Cranfield School of Management, where the research interests include:

Sustainable agriculture, precision agriculture, soil biology, plant genomics, seed biology, food microbiology (bacteriology and mycology) and postharvest technology. This wide range of research activities and our network of national and international collaborations gives us the opportunity to offer a variety of research projects to our MSc students that suit their individual research interests.

Cranfield University also actively seeks sponsorship and support for individual thesis projects from the food and environmental sector employers to provide professional experience and development opportunities for students. Thesis sponsors and supporters include: Coca Cola Enterprises, Selva Organic, McDonald's Restaurants Ltd, GreenWay Foods, Giles Foods, Discovery Foods, Edward Vinson Ltd., PepsiCo and Unilever.

Cranfield University has agreements with a number of top quality European higher education institutions. Within these agreements students from partner institutions have the opportunity to take a Master of Science (MSc) at Cranfield University as an alternative to the final year of their home university programme.

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

This course is accredited by the Institution of Agricultural Engineers (IAgrE) and the Institute of Food Science and Technology (IFST).

2. What are the aims of the course?

Cranfield University offers this course in order:

- To provide students with both the academic and practical skills used by all professionals who are concerned with the issues surrounding the production and supply of safe and high quality food in the modern world

- To develop the capacity to undertake successful technical research projects using appropriate methods of critical analysis

This programme is intended for the following range of students:

- Graduates with honours degree and equivalent ideally in a subject related to a component of the course
- Graduates currently in employment keen to extend their qualifications or to pursue a career change
- Individuals with other qualifications but who possess considerable relevant professional experience

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate in Food Systems and Management

In completing this course, and achieving the associated award, a diligent student should be able to:

ILO 1. Evaluate and compare the utilisation of classical and the most recent technologies in order to improve or maintain food quality at different stages of the food chain (pre- and post-harvest, transport, processing).

ILO 2. Compare the importance of different food contaminants and analysis techniques to evaluate the utilisation of existing and new methodologies to reduce food contamination in different food chains thus improving food safety.

ILO 3. Holistically analyse different food chains considering their multiple stages, including the management and business-wide needs, and diversity to identify strengths and weaknesses by synthesising existing knowledge and proposing potential improvements to increase final product quality and safety and increase the potential business success.

B. Postgraduate Diploma in Food Systems and Management

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

ILO 4. Integrate knowledge, understanding and skills from the taught modules in a real-life situations to address problems faced by industrial clients; creating new problem diagnoses designs, or system insights; and communicating findings in a professional manner in written, oral and visual forms

C. MSc in Food Systems and Management

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

ILO 5. Define a research question, develop aim(s) and objectives, select and execute a methodology, analyse data, evaluate findings critically and draw justifiable conclusions, demonstrating self-direction and originality of thought.

ILO 6. To communicate their individual research via a thesis and in an oral presentation in a style suitable for academic and professional audiences.

4. How is the course taught?

The MSc course is taught in three sections: taught modules (40%), group project (20%), and an individual research project (40%).

The taught programme, typically delivered between October and February, comprises a structured sequence of modules, each containing a series of lectures and other classroom-based teaching, supplemented by practical work. The taught modules are assessed by assignments. Each module is taught over one week mainly, usually followed by a week largely free of structured teaching to allow time for more independent learning and reflection.

The Group Projects are group-based research programs typically undertaken between February and April. The projects are designed to integrate knowledge, understanding and skills from the taught modules in a real-life situation. Part time students that might have problems when scheduling the group project are offered the possibility to develop a dissertation, which in most situations will be based around a topic relevant to the student's work. The definition of the dissertation topic will be determined in consultation with the Food Systems and Management Course Director. It is expected that the dissertation will be submitted at the beginning of the second year of part time study (if the course is taken over two years). However, the precise date of submission will be agreed with the Course Director.

The thesis project, typically delivered between May and September, further develops research and project management skills that: provide the ability to think and work in an original way; contribute to knowledge; overcome genuine problems; and communicate through **a thesis and oral exam**. Each student is allocated a supervisor, who will guide and assess the student work.

Guidance sessions are provided as to what is required **from thesis and oral presentation.**

Within induction week, students will be introduced to personal development planning and asked to reflect on their transferable skills and to take ownership of their personal development during the course.

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 8. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. Postgraduate Certificate

The accumulation of 60 credits through the assessment of taught modules as detailed below:

Description	**Credits**
COMPULSORY MODULES:	
Induction Module Quality of Food & Beverages Food Diagnostics Food Safety Postharvest Technology Agrifood Business Innovation	0 10 10 20 10 10
ELECTIVE MODULES:	
N/A	
TOTAL:	60

B. Postgraduate Diploma

The accumulation of 120 credits through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Induction Module Food Diagnostics Food Safety Leading Corporate Sustainability Quality of Food & Beverages Postharvest Technology Food Chain Resilience Agrifood Business Innovation Group project (Full time or Part Time students)	0 10 20 10 10 10 10 10 40
ELECTIVE MODULES:	
Dissertation in place of Group Project (Part time only)	40
TOTAL:	120

C. MSc

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	Credits
COMPULSORY MODULES:	
Induction Module Food Diagnostics Food Safety Leading Corporate Sustainability Quality of Food & Beverages Postharvest Technology Food Chain Resilience Agrifood Business Innovation Group project (Full time or Part Time students) Individual thesis project	0 10 20 10 10 10 10 10 40 80
ELECTIVE MODULES:	
Dissertation in place of Group Project (Part time only)	40
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of ≥50%;
- An average mark of ≥50% across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout

the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee); [3]

- **For Taught Assessments,** the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
  - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of ≥50% across the taught assessments);
  - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
  - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥40 credits, which are not part of the taught assessment average), the pass mark of ≥50% (where they exist);
- **For the thesis,** a mark of ≥50% in order to receive a pass (where it exists).

6. How is the course structured?

Please see the course structure document for details on the individual elements of the course. Full-time students register for the course in October and are expected to complete the course within 12 calendar months.

The course is also offered on a part-time basis and such students are expected to complete the course within 2 to 3 years. Part-time students are not restricted to starting in October. Instead they are offered individual guidance on the best sequence of study based on their prior knowledge and availability to attend.

Ideally part time students will join in time to undertake the Induction module with the rest of the cohort, but where this is not possible ad hoc induction sessions can be arranged.

[3] Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of <40% (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award (<50%).

7. Course Level Assessment Strategy[4]

The Food Systems and Management level assessment strategy complies with the principles of the UK Quality code for Higher Education. It considers a diverse range of assessments with both summative and formative feedback, so that we can cater for different student learning styles, backgrounds and aptitudes. Examples of course assessments can be found below:

- *Individual coursework* (ICW)/assignment: Individual written assignments are widely used throughout the modules to assess the students' learning achievement via summative assessment.
- *Individual or group oral presentations* provide opportunities for students to be both summatively or formatively assessed, depending on the module's specifications. Constructive verbal feedback is provided immediately and based on the module's assessment criteria; in a wider sense, strong points and areas for improvement are also highlighted (e.g. presentation skills). Timely written feedback will also be provided to enhance student learning.
- *Group activities or laboratory practicals*: formative feedback is given during the course of the activity, assessing how they approach the learning process, if they achieve the ILOs they are working towards, guiding them to the correct answer, etc. These activities are a good opportunity for learners to put into practice the more theoretical concepts assimilated during the modules – application of knowledge; they facilitate 'learning by doing'.
- *Directed and specific questions* during lectures/practical sessions help opening a constructive debate whilst assessing learners understanding and engagement on the particular topic. These activities provide opportunities for immediate formative feedback.
- *Quizzes.* On-line quizzes (e.g. Socrative), are used to formatively assess the level of individual understanding, and whether the ILOs have been achieved. It is suitable for those students that are less confident in speaking aloud; it can be anonymous and also gives some kind of healthy competition. The learners receive immediate feedback from the facilitator/tutor, who can clarify and support areas of improvement in a more 'casual/friendly' environment.

Assessment details for the Group Project, Dissertation and Individual Research Project/Thesis are provided below.

Group Project:
The group project provides the students with the opportunity to gain professional skills expected of the workplace. In addition to technical skill practice, students develop a range of soft skills such as team working, problem solving, communication skills and reflective practice. The students work in small consultancy teams typically on a client sponsored project for a period of 10 weeks. Many teams will be made up of students from different courses giving the students the opportunity of working in an interdisciplinary team. The students are responsible for interpreting the brief, developing a project plan, selecting and implementing a methodology, deriving results, analysing the results and drawing conclusions in alignment with the aims and objectives.

All students participate in a peer review activity providing them with the opportunity to reflect on the practices of their colleagues as well as their own. Peer review feedback is provided individually by an independent member of academic staff. A single group report is produced and the project is presented orally at the concluding Exhibition Day; both elements are summatively assessed by independent markers and a group mark is assigned per element. Individual assessment is derived from supervisor observation and meeting minute actions and an individual reflective report where the students reflect on the development of three soft skill competencies based on objectives that they set for themselves. The team working competency is mandatory as one of the three skills for each student. The students will also receive

[4] Guidance to aid colleagues writing or updating a course-level assessment strategy for inclusion in the Course Specification can be found as Appendix K in either the Senate Handbook on Setting up a New Taught Course or the Senate Handbook on Managing Taught Courses https://intranet.cranfield.ac.uk/EducationServices/Pages/SenateHandbooksA-Z.aspx

formative feedback from their supervisors, both verbally and in written, on for example: report drafts, meeting discussions, etc., over the course of the Group Project.

Dissertation:
Part time students are not required to complete the Group Project undertaken by the full time registered students on a SWEE MSc course. An alternative assignment takes the form of a dissertation or design project which in most situations will be based around a topic relevant to the work of the part-time student. It is evident that some aspects of the Group Project experience that the work-based dissertation replaces – for example the client interaction and group dynamics components will not directly replicated by undertaking this assignment. It is expected that these experiences would normally be a part of the normal working life of the part-time student.

It is expected that the dissertation will normally consist of the following elements: Abstract, Background context, Introduction to the theme(s) addressed within the dissertation, setting out the issues that will be covered, Methodology, In depth analysis/discussion of the topics discussed, Concluding remarks, References, Appendices (if relevant). Two supervisors are allocated to the dissertation and supervision follows the model used for the independent research project. The student will submit a 6,000 word report and will give an oral presentation of their work. Both elements of the assessment will be marked by independent assessors (summative assessment). Formative feedback will be provided regularly: e.g. verbally during the regular meetings with the supervisor; and in written on any draft produced prior to the submission, as well as in the submitted version.

Individual Research Project/Thesis
The individual research project requires students to further develop problem definition, hypothesis setting, select and execute a methodology, analyse data, and evaluate findings and draw appropriate conclusions in the context of research questions relevant to the course followed by a student. The student is required to communicate their findings successfully via a thesis, written in the style of a scientific paper, and an oral presentation based around a poster. The projects are designed to integrate knowledge, the taught modules, and apply understanding and skills from the group project, to deliver a high quality written thesis and oral presentation. The individual research project/thesis is typically delivered through collaboration with an industrial sponsor, or it may be an ‘internal’ project reflecting the research interests of the School.

The students will receive formative feedback on both the poster and the thesis during the course of the Individual Thesis Project. This feedback will be provided verbally during the regular meetings with the supervisors; or in written, in the form of specific comments on the different drafts provided prior to submission. Written feedback will also be provided on the submitted version of the thesis. The summative feedback is allocated as 10% for the poster presentation and 90% for the thesis document.

Course modules - all Occ A unless specified

The following modules outline all parts of the programme leading to **MSc.** Other awards associated with the course include some or all of these modules.

Module Number	Module code	Title	Module Leader	Contact hours[5]	Total hours delivered by Visiting Lecturers[6]	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[7] - 40% or 50%	Type of Assessment	Weighting within module[8] (%) of Independent	Weighting within module of multi-part assessments[9] (100%)	Type of Assessment	Weighting of individual elements of multi-part assessment[10]	Assessment Submission and/or exam date[11]	Assessment / Exam Retake date
1	I-AGF-INWK	Induction Week	Sofia Kourmpetli	33		0	Y		02/10/23	06/10/23	N/A	AO	N/A				N/A	N/A
2	I-AGF-PBFQ	Quality of Food and Beverages	Andrew Thompson	31	3	10	N		09/10/23	20/10/23	40	IPRES	100				FT/PT 19/10/23	05/24
3	I-FCS-A1007	Postharvest Technology	Natalia Falagan Sama	31	1	10	N		23/10/23	03/11/23	40	ICW	100				FT 04/11/23 PT 18/11/23	05/24

[5] Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice
[6] Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)
[7] A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.
[8] For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education
[9] For **multi-part assessments** please record the overall weighting of module which should be 100%. Multipart assessments should only be included in courses where there is a clear androgogical reason and where each element forms part of a continuous learning and assessment experience for students.
[10] Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate*).* If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.
[11] Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours[5]	Total hours delivered by Visiting Lecturers [6]	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[7] - 40% or 50%	Type of Assessment	Weighting within module[8] (%) of Independent	Weighting within module of multi-part assessments [9](100%)	Type of Assessment	Weighting of individual elements of multi-part assessment[10]	Assessment Submission and/or exam date[11]	Assessment / Exam Retake date
4	I-FCS-A1005	Food Diagnostics	Carmen Alamar Gavidia	29	4	10	N		06/11/23	17/11/23	40	ICW	100				FT 18/11/23 PT 02/12/23	05/24
5	I-FFS-FCR	Food Chain Resilience	Abhi Ghadge	25		10	Y		20/11/23	01/12/23	40	ICW	100				FT 02/12/23 PT 06/01/24	05/24
6	M-T/LCS Occ C	Leading Corporate Sustainability	Namita Shete	20		10	Y		04/12/23	15/12/23	40	ICW	100				FT/ PT 06/01/24	05/24
7	I-FCS-FSQMC	Food Safety	Carol Verheecke-Vaessen	71.5		20	N		08/01/24	02/02/24	40	IPRES ICW	65 35				FT/PT 01/02/24 FT 03/02/24 PT 17/02/24	05/24
8	I-FCS-ABI	Agrifood Business Innovation	Andrea Patriarca	29	18	10	N		05/02/24	16/02/24	40	ICW	100				FT 17/02/24 PT 02/03/24	05/24
9	I-SWEE-GRPP	Group Project	Jitka MacAdam	16		40	Y		26/02/24	03/05/24	50 50 50 50	GCW GPRES ICW RP	64 16 10 10				26/04/24 @ 16.00 23/04/24 @ 16.00 03/05/24 04/05/24 @ 23.59	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours[5]	Total hours delivered by Visiting Lecturers [6]	Credits	Is the module shared? Y/N	Calendar			Assessment							
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[7] - 40% or 50%	Type of Assessment	Weighting within module[8] (%) of Independent	Weighting within module of multi-part assessments [9](100%)	Type of Assessment	Weighting of individual elements of multi-part assessment[10]	Assessment Submission and/or exam date[11]	Assessment / Exam Retake date
10	I-SWEE-DISS	Dissertation in place of group project for part time students	Jitka MacAdam	10		40	Y		26/02/24	20/09/24	50	IPROJ IPRES	80 20				20/09/24 w/c 23/09/24	SEPT 25
11	I-SWEE-THES	Thesis Project	Jitka MacAdam	20		80	Y		07/05/24	07/09/24	50 50	THESIS OR	90 10				02/09/24 @ 16.00 W/C 27/08/24-04/09/24	SEPT 25

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Please list all modules that are used by another existing course.

Module code	**Module title**	**Course that owns the module**	**Other course(s)/ programme(s) that use the module**
I-AGF-INWK	Induction week	Applied Bioinformatics	Food Systems and Management Future Food Sustainability
I-FFS-FCR	Food Chain Resilience	Future Food Sustainability	Food Systems and Management
M-T/LCS	Leading Corporate Sustainability	Food Systems and Management	Environmental Management for Business Global Environmental Change
I-SWEE-GRPP	Group Project	Advanced Water Management	All SWEE courses
I-SWEE-DISS	Dissertation in place of group project for part time students	Advanced Water Management	All SWEE courses
I-SWEE-THES	Thesis Project	Advanced Water Management	All SWEE courses

8. How are the ILOs assessed?

The following assessment types are utilised:

- the taught modules (40%) are assessed by in-module assessment (including coursework, which focuses on application of principles studied and class tests, which support underpinning knowledge).
- group projects (20%) are assessed by means of a written group report, presentations and an individual contribution component. For part time students a dissertation based around a topic relevant to the student work will be evaluated.
- the research project (40%), is assessed by a thesis and an oral examination

This approach has been adopted because:

This is the standard criteria of assignment in SWEE.

Assessment and ILO Mapping

A. Postgraduate Certificate in Food Systems and Management

Award ILOs / Module No.	ILO 1.	ILO 2.	ILO 3.
2	IPRES		
3	ICW	ICW	
4	ICW	ICW	
5	ICW	ICW	ICW

Award ILOs / Module No.	ILO 1.	ILO 2.	ILO 3.
6			ICW
7		ICW	IPRES
8		ICW	ICW

B. Postgraduate Diploma in Food Systems and Management

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs / Module No.	ILO 4.
09	GPROJ GCW RP ICW
10	IPROJ IPRES

C. MSc in Food Systems and Management

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs / Module No.	ILO 5.	ILO 6.
11	THESIS/ OR	THESIS/ OR

CROSS-MODULAR ASSESSMENT

Title	Modules Covered	Assessment	
		Type	Weight (%)

9. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who provides authoritative guidance on policy and

procedure to the Panel. Proposals are reviewed in line with the UK Quality Code for Higher Education. New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth 6 year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guiding principles to meet the Expectations and Core Practices of the UK Quality Code for Higher Education. External examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the UK Quality Code for Higher Education. The delivery of new partnership provision is ultimately approved by the Universities Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5 year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

10. What opportunities are graduates likely to have on completing the course?

On completion, graduates have a broader network of global contacts, increased opportunities for individual specialism in their chosen career.
Some of the employers over the last three years include:

- Coca Cola Enterprises
- Giles Foods
- G's
- Mars
- PepsiCo

COURSE SPECIFICATION

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

Date of latest revision:	June 2024

1. What is the course?

Course information

Course Title	Forensic Programme
Course code	**MSc, PgDip Forensic Archaeology and Anthropology** (MSFAAFTC, PDFAAFTC, MSFAAPTC, PDFAAPTC) **MSc, PgDip Forensic Ballistics** (MSFBLFTC, PDFBLFTC, MSFBLPTC, PDFBLPTC) **MSc, PgDip Forensic Explosives and Explosion Investigation** (MSFEIFTC, PDFEIFTC, MSFEIPTC, PDFEIPTC) **MSc, PgDip, PgCert Forensic Investigation** (MSFOIFTR, PDFOIFTC, MSFOIPTC, PDFOIPTC, PCFOIFTC, PCFOIPTC) **MSc, PgDip, PgCert Investigation of Heritage Crime** (MSFHCFTC, MSFHCPTC, PDFHCFTC, PDFHCPTC, PCFHCFTC, PCFHCPTC) will not run AY23/24 **MSc, PgDip, Forensic Biology** (MSFBYFTC, PDFBYFTC, MSFBYPTC, PDFBYPTC) **Short Course for Credit** SPFPPPTC
Academic Year	2023/2024
Valid entry routes	MSc, PgDip, PgCert
Additional exit routes	PgDip, PgCert in FI* or IHC
Mode of delivery	Full-time, Part-time
Location(s) of Study	Cranfield and Shrivenham (with some elements of Offsite delivery)
School(s)	Cranfield Defence and Security
Theme	Defence and Security
Centre	Cranfield Forensic Institute
Programme Director **Course Director**	Laura Hugh/Nicola Marquez-Grant(Programme Directors) Dr Hannah Moore (Forensic Investigation) Dr David Erickson (Forensic Archaeology and Anthropology) Dr Kate Hewins (Forensic Ballistics) Mr Mike Harris (Forensic Explosives and Explosion Investigation) Dr Peter Campbell (Investigation of Heritage Crime)

	Ms Laura Hugh (Forensic Biology)
Awarding Body	Cranfield University
Is this an AP Contract course?[1]	No (CEDC module is part of the AP contract)
Is this course offered as a Cranfield Mastership?	No
Apprenticeship Standard the course is mapped to	NA
Is the Degree apprenticeship integrated or non-integrated?	NA
Is the Mastership offered as an open and/or closed course?	NA
Teaching Institution	Cranfield University
Admissions body	Cranfield University
Entry requirements	Standard University entry requirements
UK Qualifications Framework Level	QAA FHEQ level 7 (Masters)
Benchmark Statement(s)	N/A
Registration Period(s) available	Part-time: MSc 3 years, PgDip and PgCert 2 years or Full-time: MSc 11 months, PgDip and PgCert 1 year
Course Start Month(s)	September

*Students on FBL, FAA, FBio and FEI wishing to exit early when registered on an MSc or PGDip Award need to transfer to PGCert in FI as the exit route.

Institutions delivering the course

This course is delivered by Cranfield Forensic Institute within Cranfield Defence and Security, where the research interests include security technology, forensic biology, forensic archaeology and anthropology, ballistics, explosives, , forensic and security imaging and heritage crime.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)

Parts of this programme (FI, FAA, FBLand FEEI) are accredited formally by the Chartered Society of Forensic Sciences until April 2028.
FEEI is accredited formally by Institute of Explosive Engineers

2. What are the aims of the course?

Cranfield University offers these courses in order to:

- Give students the tools to identify how physical sciences and other specific disciplines can be used to resolve issues in relation to civil and criminal law.
- Equip students with the essential knowledge and expertise to prepare them to practise as professional forensic scientists, expert witnesses and heritage crime investigators.

[1] AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Postgraduate Diploma (PgDip) is available as an entry and exit route to all Named Awards on the Forensic Programme.

Postgraduate Certificate (PgCert) is **only** available as an entry and exit route on Forensic Investigation and Investigation of Heritage Crime.

This programme is intended for the following range of students:

- graduates with relevant first degrees
- other graduates working in relevant professional fields of study, including forensic science, heritage crime and law
- practitioners in forensic science and heritage crime.

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate

In completing this course, and achieving the associated award, a diligent student should be able to:

ILO 1. Analyse and critically review current practice in forensic science.
ILO 2. Categorize and compare a wide range of different types of evidence using many of the techniques within the armoury of the modern forensic scientist, engineer or heritage crime investigator.
ILO 3. Critically assess data through the selection of appropriate statistical tests or reasoning.
ILO 4. Systematically organise evidence to ensure its traceability.
ILO 5. Construct an argument and communicate it effectively in a form suitable for a specific target audience, such as technical reports, expert witness statements and the presentation of evidence in court.
ILO 6. Collect and evaluate information and compose reports using a wide range of transferable skills through literature searches, databases, the Internet and desktop publishing.
ILO 7. Evaluate the collection and preservation methods in relation to anti-contamination of the crime scene.

B. Postgraduate Diploma

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

ILO 8. Evaluate a wide range of evidence from adjacent disciplines that impact on forensics in archaeology, anthropology or the physical and life sciences according to the particular course on which a student has studied.

C. MSc

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

ILO 9. Independently design, plan and execute a detailed research project and present results at meetings.

ILO 10. write a research thesis that includes:

- a critical review of established forensic practice in a particular field.
- a critical evaluation of current research and methodologies in that area, judging good and bad practice, and defending their opinions.
- a clear explanation of experimental/analytical procedures and the evaluation of results by appropriate means.
- self-critical evaluation of experimental/analytical results with conclusions that place the research in the context of the professional practice of the forensic sciences.

4. How are the courses taught?

Students will be supported in their learning and personal development by:

- research led teaching – through a course team that are active researchers or practitioners
- hands-on experience – experience-based learning through students spending time in the laboratory
- learning through assessment methods - we view assessment as part of the learning process, with a variety of assessment methods extending the curriculum and transferable skills
- an immersion culture – as part of the Cranfield experience we aim to fully immerse our students in forensics, not just through lectures, tutorials, and workshops, but also through social interaction with teaching staff.

The main instrument of teaching and learning in the taught phase modules remains the traditional lecture, incorporating the effective use of visual aids and supported by high quality written material where appropriate. Tutorial sessions centring on a particular subject area or involving more wide-ranging discussions are also an important feature of the course. However, there is a growing move to reduce the amount of teacher-centred learning and allow students to take the initiative in the learning process. Thus, some modules include a requirement for each student to make an oral presentation to the rest of the class on a piece of practical work or a specific subject in the literature that is then assessed by the staff present. This is a challenging task, but students recognise its importance in the context of a future career in forensic science and find it stimulating. Students are required to present their written work in a variety of forms, including the conventional essay as well as laboratory reports and expert witness statements. In the case of MSc students this includes presenting the results of their individual research project in the format of a thesis or a journal paper plus a separate literature review. The emphasis is always on clear, concise, and accurate presentation. This ensures that students are continually encouraged to think about report writing and are given frequent opportunities to improve their techniques as they progress through the course. The ‘Courtroom Skills’ module provides a focus for the discussion of verbal and writing skills, but students are giving guidance on reports and presentations at a very early stage in the course during Introductory Studies. Many modules employ role play to demonstrate how theory is put into practice. This ranges from crime scene exercises where students work in small groups collecting evidence according to a range of different scenarios, to working in larger groups on mass grave excavations and ‘war games’ to simulate heritage crime investigations.

In addition to the teaching methods outlined, students will be supported in their learning and personal development by:

1. Good staff student relations. Staff endeavour to be enthusiastic and helpful and experience has shown that the students respond accordingly. The Course Director or Programme Director will address any immediate issues of concern that a student or students may have in connection with the course.
2. All students are provided with a personal tutor who is available to support the student and advise on academic issues and provide pastoral care. Students are encouraged to meet with their personal tutors at least twice during the taught phase of the course. Additional meetings are scheduled as required.
3. After the taught phase pastoral care largely transfers to the student’s individual research project supervisor, who they are encouraged to meet with regularly.

4. Each course within the Forensic Programme is managed by a director who is a subject matter expert and who can specifically advise on matters relating to choice of elective module.

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 6. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. Postgraduate Diploma in Forensic Archaeology and Anthropology

The accumulation of 120 credits[2] through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Modules 1-5 Modules 13-16	50 40
ELECTIVE MODULES:	
30 credits selected from any of the following: 8, 10, 17, 18, 19, 20, 21, 22, 23, 28 - 31, 33 - 34, 37, 38, 40-42, *Some elective modules will require additional security clearance. *Module 28 is a pre-requisite for module 29 *Module 30 is a pre-requisite for module 31 *Module 38 is a pre-requisite for module 40	30
TOTAL:	**120**

B. MSc in Forensic Archaeology and Anthropology

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	Credits
COMPULSORY MODULES:	
Modules 1-5 Modules 13-16 Thesis (43)	50 40 80
ELECTIVE MODULES:	
30 credits selected from any of the following: 8, 10, 17, 18, 19, 20, 21, 22, 23, 28 - 31, 33 - 34, 37, 38, 40 - 42 *Some elective modules will require additional security clearance. *Module 28 is a pre-requisite for module 29 *Module 30 is a pre-requisite for module 31 *Module 38 is a pre-requisite for module 40	30

[2] Senate Regulations require a minimum of 120 learning credits to be accumulated for the Award of PgDip. The number of learning credits is set during course validation.

TOTAL:	**200**

C. Postgraduate Diploma in Forensic Ballistics

The accumulation of 120 credits[3] through the assessment of taught modules as detailed below:

Description	**Credits**
COMPULSORY MODULES:	
Modules 1, 2, 3, 5 Modules 9, 10, 11, 12, 25, 26	30 60
ELECTIVE MODULES:	
30 credits selected from any of the following: 6, 7, 8,13, 15, 18, 19, 20, 21, 22, 23, 24, 27, 28 - 31,33, 34,35, 36, 38, 41, 42 *Module 28 is a pre-requisite for module 29 *Module 30 is a pre-requisite for module 31	30
TOTAL:	**120**

D. MSc in Forensic Ballistics

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	**Credits**
COMPULSORY MODULES:	
Modules 1, 2, 3, 5 Modules 9, 10, 11, 12, 25, 26 Thesis (43)	30 60 80
ELECTIVE MODULES:	
30 credits selected from any of the following: 6, 7, 8, 13, 15, 18, 19, 20, 21, 22, 23, 24, 27, 28 - 31, 33 - 36, 38, 41, 42 *Module 28 is a pre-requisite for module 29 *Module 30 is a pre-requisite for module 31 *Module 34 is a pre-requisite to module 35 *Module 35 is a pre-requisite for module 7	30
TOTAL:	**200**

E. Postgraduate Diploma in Forensic Explosives and Explosion Investigation

The accumulation of 120 credits[4] through the assessment of taught modules as detailed below:

[3] Senate Regulations require a minimum of 120 learning credits to be accumulated for the Award of PgDip. The number of learning credits is set during course validation.

[4] Senate Regulations require a minimum of 120 learning credits to be accumulated for the Award of PgDip. The number of learning credits is set during course validation.

Description	Credits
COMPULSORY MODULES:	
Modules 1, 2, 3, 5 Modules 6, 24, 25, 26, 27, 7	30 60
ELECTIVE MODULES:	
30 credits selected from any of the following: 7, 8, 9, 10, 11, 12 13, 15, 18, 19, 20, 21, 22, 23, 28 - 31, 33, 34, 36, 38, 40-42 *Module 10 is a pre-requisite for module 11 *Module 28 is a pre-requisite for module 29 *Module 30 is a pre-requisite for module 31 *Module 34 is a pre-requisite to module 35 *Module 35 is a pre-requisite for module 7 *Module 38 is a pre-requisite for module 40	30
TOTAL:	**120**

F. MSc in Forensic Explosives and Explosion Investigation

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	Credits
COMPULSORY MODULES:	
Modules 1, 2, 3, 5 Modules 6, 7 24, 25, 26, 27,7 Thesis (43)	30 60 80
ELECTIVE MODULES:	
30 credits selected from any of the following: 7, 8, 9, 10, 11, 12 13, 15, 18, 19, 20, 21, 22, 23, 28 - 31, 33, 34, 36, 38, 40-42 *Module 10 is a pre-requisite for module 11 *Module 28 is a pre-requisite for module 29 *Module 30 is a pre-requisite for module 31 *Module 34 is a pre-requisite to module 35 *Module 35 is a pre-requisite for module 7 *Module 38 is a pre-requisite for module 40	30
TOTAL:	**200**

G. Postgraduate Certificate in Forensic Investigation

The accumulation of 60 credits[5] through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
30 credits selected from Modules 1-5, 36	30
ELECTIVE MODULES:	
30 credits: To be agreed with the Course Director from the remaining modules 6 – 15, 17 - 24, 28 – 35, 37, 38, 40-42 *Some elective modules will require additional security clearance. *Module 10 is a pre-requisite for module 11	30

[5] Senate Regulations require a minimum of 60 learning credits to be accumulated for the Award of PgCert. The number of learning credits for individual courses is set during course validation.

*Module 2 is a pre-requisite for Module 36 *Module 11 is a pre-requisite for module 12 *Module 28 is a pre-requisite for module 29 *Module 30 is a pre-requisite for module 31 *Module 34 is a pre-requisite to module 35 *Module 35 is a pre-requisite to module 7 *Module 38 is a pre-requisite for module 40	
TOTAL:	**60**

H. Postgraduate Diploma in Forensic Investigation

The accumulation of 120 credits[6] through the assessment of taught modules as detailed below:

Description	**Credits**
COMPULSORY MODULES:	
Modules 1-5, 36	60
ELECTIVE MODULES:	
60 credits selected from any of the following: 6 – 15, 17 - 24, 28 – 35, 37, 38, 40-42 *Some elective modules will require additional security clearance. *Module 10 is a pre-requisite for module 11 *Module 2 is a pre-requisite for Module 36 *Module 11 is a pre-requisite for module 12 *Module 28 is a pre-requisite for module 29 *Module 30 is a pre-requisite for module 31 *Module 34 is a pre-requisite to module 35 *Module 35 is a pre-requisite to module 7 *Module 38 is a pre-requisite for module 40	60
TOTAL:	**120**

I. MSc in Forensic Investigation

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	**Credits**
COMPULSORY MODULES:	
Modules 1-5, 36 Thesis (43)	60 80
ELECTIVE MODULES:	
60 credits selected from any of the following: 6 – 15, 17 - 24, 28 – 35, 37, 38, 40-42 *Some elective modules will require additional security clearance. *Module 10 is a pre-requisite for module 11 *Module 2 is a pre-requisite for Module 36 *Module 11 is a pre-requisite for module 12 *Module 28 is a pre-requisite for module 29 *Module 30 is a pre-requisite for module 31 *Module 34 is a pre-requisite to module 35 *Module 35 is a pre-requisite to module 7 *Module 38 is a pre-requisite for module 40	60

[6] Senate Regulations require a minimum of 120 learning credits to be accumulated for the Award of PgDip. The number of learning credits is set during course validation.

TOTAL:	**200**

J. Postgraduate Certificate in Investigation of Heritage Crime

The accumulation of 60 credits[7] through the assessment of taught modules as detailed below:

Description	**Credits**
COMPULSORY MODULES:	
20 credits selected from modules: 1, 2, 3, 5 30 credits selected from modules: 20, 28, 29, 30, 31,	20 30
ELECTIVE MODULES:	
10 credits: To be agreed with the Course Director from the remaining modules from: 8, 10, 13, 15, 17 - 19, 21 – 25, 34, 37, 38, 41,42 *module 28 is a pre-requisite for module 29 *module 29 is a pre-requisite for module 30 *Some elective modules will require additional security clearance.	10
TOTAL:	**60**

K. Postgraduate Diploma in Investigation of Heritage Crime

The accumulation of 120 credits[8] through the assessment of taught modules as detailed below:

Description	**Credits**
COMPULSORY MODULES:	
Modules 1, 2, 3, 5 Modules 20, 28, 29, 30, 31	30 50
ELECTIVE MODULES:	
40 credits selected from any of the following: 4, 8, 10, 13, 15, 17 - 19, 21 – 25, 34, 37, 38, 41,42 *module 28 is a pre-requisite for module 29 *module 29 is a pre-requisite for module 30 *Some elective modules will require additional security clearance.	40
TOTAL:	**120**

L. MSc in Investigation of Heritage Crime

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	**Credits**
COMPULSORY MODULES:	
Modules 1, 2, 3, 5	30

[7] Senate Regulations require a minimum of 60 learning credits to be accumulated for the Award of PgCert. The number of learning credits for individual courses is set during course validation.

[8] Senate Regulations require a minimum of 120 learning credits to be accumulated for the Award of PgDip. The number of learning credits is set during course validation.

Modules 20, 28, 29, 30, 31 Thesis (43)	50 80
ELECTIVE MODULES:	
40 credits selected from any of the following: 4, 8, 10, 13, 15, 17 - 19, 21 – 25, 34, 37, 38, 41,42 *module 28 is a pre-requisite for module 29 *module 29 is a pre-requisite for module 30 *Some elective modules will require additional security clearance.	40
TOTAL:	**200**

M. Postgraduate Diploma in Forensic Biology

The accumulation of 120 credits[9] through the assessment of taught modules as detailed below:

Description	**Credits**
COMPULSORY MODULES:	
Modules 1-5 Modules 38 - 40 *Module 38 is a pre-requisite for modules 40 *Module 40 is a pre-requisite for modules 39	50 30
ELECTIVE MODULES:	
40 credits selected from any of the following: 7, 8, 14,15, 17-21, 33-35, 37, 41, 42 *Module 34 is a pre-requisite to module 35 *Module 36 is a pre-requisite to module 7	40
TOTAL:	**120**

N. MSc in Forensic Biology

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	**Credits**
COMPULSORY MODULES:	
Modules 1-5 Modules 38-40 Thesis (43)	50 30 80
ELECTIVE MODULES:	
40 credits selected from any of the following: 7, 8, 14, 15, 17- 21, 33-35, 37, 41, 42 *Module 35 is a pre-requisite to module 36 *Module 36 is a pre-requisite to module 7	40
TOTAL:	**200**

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists, and the student meets the requirements of that lower award.

[9] Senate Regulations require a minimum of 120 learning credits to be accumulated for the Award of PgDip. The number of learning credits is set during course validation.

Pass Criteria
The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of ≥50%;
- An average mark of ≥50% across the taught assessment.
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee); [10]
- **For Taught Assessments,** the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
  - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of ≥50% across the taught assessments);
  - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
  - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥40 credits, which are not part of the taught assessment average), the pass mark of ≥50% (where they exist);
- **For the thesis,** a mark of ≥50% in order to receive a pass (where it exists).

6. How is the course structured?

Full-time students register for the course in October and are normally expected to complete the PgCert course within 44 weeks, the PgDip course with 44 weeks and the MSc course within 44 weeks. The PgCert is only available for Forensic Investigation and Investigation of Heritage Crime.

Part-time students register for the course in October and are expected to complete the MSc within 3 years, the PgDip within 2 years and the PgCert within 2 years.

The MSc programmes are made up 200 credits, (120 gained through taught modules and 80 credit through a research project). Each MSc programme is constructed of:

· **Compulsory modules** that cover important generic skills within the forensic sector as well as theme specific modules that directly relate and link to the specialism studied.

·and **Elective modules** that allow students to specialise in areas that support their own career objectives.

[10] Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of <40% (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award (<50%).

The detail regarding the specific construction of each MSc theme can be seen in the illustration below.

This programme construction gives the student the increased flexibility to 'design' their own course to meet their own career objectives, with FI being the most flexible option with 6 elective options.
The 80-credit research project is theme specific, where the student gets the opportunity to complete specialised research supported by an SME. In consultation with the supervisor, the student may submit either a 20,000 word thesis on their area of research or an academic paper, intended for journal submission (in addition to a full literature review).

The majority of the modules which run within the FP are 10 credits and run over a 5-day consolidation period (exceptions include Analytical Techniques which runs over 10 days, Forensic Archaeology: Mass Grave Excavation which runs over 7 days and Practical Archaeological Excavation which runs over 10 days.). Assessments for modules vary and may include oral presentations that run within the 5 day modules. The majority of assessments are completed after the residential element. The coursework for Courtroom Skills is submitted before the module with a practical assessment completed during the residential week.

Students would normally commence their individual research project only on successful completion of the taught component of the course. It is expected that the individual research project will normally fall within the scope of the dominant theme established in the taught phase.

7. Course Level Assessment Strategy[11]

The Forensic Programme aims to equip students with the necessary understanding of science and other specific disciplines, courtroom skills and research methods in order to prepare them to practise as professional forensic practitioners. To reflect this our assessment strategy uses coursework assignments as opposed to the conventional written examination. These are limited to a few occasions throughout the

[11] Guidance to aid colleagues writing or updating a course-level assessment strategy for inclusion in the Course Specification can be found as Appendix K in either the Senate Handbook on Setting up a New Taught Course or the Senate Handbook on Managing Taught Courses https://intranet.cranfield.ac.uk/EducationServices/Pages/SenateHandbooksA-Z.aspx

course where specific skills are tested. Summative assessments often involve a practical exercise that can be laboratory or field based and presented as a casework scenario or as role-play. These are assessed through a written technical report, expert witness statement or an oral presentation.

Students undertake a spectrum of assessment types throughout the course. Different types of summative assessment allow us to assess different aspects of the student's knowledge and ability and allow us to cover a range of preferred learning/assessment styles. Professional skills are developed through writing expert witness statements and analytical reports on case studies and practical work, with a particular emphasis on clear and concise presentation. These involve a variety of tasks such as the assessment of firearms operation, an evaluation of health and safety at a hazardous scene and documenting a mass grave excavation. Both individual and group presentations and briefings are used to assess communication skills appropriate for a range of target audiences, providing both formative and summative assessment.

The Forensic Programme has very few formal examinations, reflecting the applied nature of the course. All students take the module *Reasoning in Forensic* Science, which covers statistical analysis and reasoning. The breadth and variety of applications covered during this module can only be accommodated by a carefully structured written examination supported by formative assessment through classroom discussions and tutorials. Similarly, the breadth and variety of skeletal remains encountered during the module *Further Forensic Anthropology – Identification*, and how they contribute to a biological profile, demands a summative assessment with comparable variety. The spotter examination does this by rotating students around a series of different stations where they answer questions about exhibits. Classroom exercises on human skeletal remains and the optional 'bone club' provide formative assessments.

The *Courtroom Skills* module is assessed by a combination of individual coursework (a written expert witness statement), and an oral assessment of performance in mock courtroom trials where students take on the role of expert witness, prosecution barrister and defence barrister. This replicates the two key roles that a Forensic Scientist may have: presenting evidence in a written form before trial and presenting evidence under cross-examination during a trial. The interactive nature of the assessment gives continuous formative assessment, introduces students to how a court runs, and assesses their verbal reasoning from both sides of an argument and how they perform within the court environment.

Course modules

The following modules outline all parts of the programme leading to an **MSc.** Other awards associated with the course include some or all of these modules.

Module Number	Module code	Title	Module Leader	Contact hours[12]	Total hours delivered by Visiting	Credits	Is the module shared? Y/N	Calendar				Assessment						
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[14] - 40% or 50%	Type of Assessment	Weighting within module[15] (%) of Independent assessments	Weighting within module of multi-part	Type of Assessment	Weighting of individual elements of multi-part assessment[17]	Assessment Submission and/or exam date[18]	Assessment / Exam Retake date
1	R-FP-IS	Introductory Studies	Peter Masters	30	0	0	Y	02/10/23	02/10/23	06/10/23	N/A	AO					N/A	N/A
2	R-FP-IEC	Investigation and Evidence Collection	Hannah Moore	30	0	10	Y	16/10/23	16/10/23	20/10/23	50	IPRES	100				FT 20/10/23 PT 20/10/23	Next available opportunity
3	R-FP-RFS	Reasoning for Forensic Science	Trevor Ringrose and Ken McNaught	25	0	10	N	09/10/23	09/10/23	13/10/23	50	EX	100				W/C the 11th Dec	W/C 19/03/24

[12] Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice
[13] Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)
[14] A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.
[15] For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education.
[16] For **multi-part assessments** please record the overall weighting of module which should be 100%. Multipart assessments should only be included in courses where there is a clear andragogical reason and where each element forms part of a continuous learning and assessment experience for students.
[17] Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate*).* If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.
[18] Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

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4	R-FP-AT	Analytical Techniques	Fiona Brock	40	5	20	N	30/10/23	30/10/23	10/11/23	50 50	ICW 1 ICW 2	50 50				FT 11/12/23 PT 03/01/24	Next available opportunity
5	R-FP-CS	Courtroom Skills	Roland Wessling/Kate Hewins	25	0	10	Y	19/02/24	19/02/24-21/02/24 and 29/04/24-01/05/24	01/05/24	50 50	OR ICW	60 40				ALL 30th April-1st May 24 ALL 28th March 24	Next available opportunity
6	R-FP-FIEED	Forensic Investigation of Explosives and Explosive Devices	Nathalie Mai and Mike Harris	37	0	10	Y	23/10/23	23/10/23	27/10/23	50	ICW	100				FT 27/11/23 PT 11/12/23	Next available opportunity
7	R-FP-FEI	Fires, Explosions and their Investigation	Mike Moulden	28	0	10	N	04/03/24	04/03/24	08/03/24	50	ICW	100				FT 08/04/24 PT 22/04/24	Next available opportunity
8	R-FP-TE	Trace Evidence	Laura Hugh	24	2	10	N	26/02/24	26/02/24	01/03/24	50	ICW	100				FT 02/04/24 PT 16/04/24	Next available opportunity
9	R-FP-MEP	Materials Engineering and	Jonathan Painter	32	0	10	N	27/11/23	27/11/23	01/12/23	50	ICW	100				FT 15/01/24 PT 29/01/24	Next available opportunity

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

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		Processing																
10	R-FP-IFIFB	Introduction to Firearms Investigations and Forensic Ballistics	Kate Hewins	32	0	10	Y	13/11/23	13/11/23	17/11/23	50	ICW	100				FT 03/01/24 PT 17/01/24	Next available opportunity
11	R-FP-FI	Firearms Investigations	Kate Hewins	32	0	10	Y	05/02/24	05/02/24	09/02/24	50	ICW	100				FT 11/03/24 PT 25/03/24	Next available opportunity
12	R-FP-FBI	Forensic Ballistics Investigations	Kate Hewins	32	0	10	Y	08/04/24	08/04/24	12/04/24	50	ICW	100				FT 13/05/24 PT 28/05/24	Next available opportunity
13	R-FP-FARBR	Forensic Archaeology: Recovering Buried Remains	Roland Wessling	28	0	10	N	23/10/23	23/10/23	27/10/23	50	ICW	100				FT 27/11/23 PT 11/12/23	Next available opportunity
14	R-FP-FAMGE	Forensic Archaeology: Mass Grave Excavation	Roland Wessling	56	0	10	N	15/04/24	15/04/24	21/04/24	50	ICW	100				FT 21/05/24 PT 04/06/24	Next available opportunity

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

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15	R-FP-FFAO	Fundamentals of Forensic Anthropology: Osteology	Nick Marquez Grant and Nivien Speith	33	0	10	Y	20/11/23	20/11/23	24/11/23	50	ICW	100				FT 15/01/24 PT 29/01/24	Next available opportunity
16	R-FP-FFAI	Further Forensic Anthropology: Identification	Nivien Speith and Nick Marquez Grant	32	0	10	N	08/01/24	08/01/24	12/01/24	50	EX	100				W/C 03/04/24	W/C 13TH MAY 2024
17	R-FP-PAE	Practical Archaeological Excavation	David Errickson	100	0	10	Y	20/05/24(2 WEEK TRIP)	20/05/24	02/06/24	50	ICW	100				FT 01/07/24 PT 15/07/24	Next available opportunity
18	R-FP-MFI	Mass Fatality Incidents	David Errickson	27	0	10	N	22/04/24	22/04/24	26/04/24	50	ICW	100				FT 28/05/24 PT 03/06/24	Next available opportunity
19	R-FP-EFS	Forensic Ecology	Hannah Moore	29	0	10	Y	05/02/24	05/02/24	09/02/24	50	ICW	100				FT 11/03/24 PT 25/03/24	Next available opportunity
20	R-FP-FF	Fakes and Forgeries	Andrew Shortland	28	0	10	Y	15/01/24	15/01/24	18/01/24	50	ICW	100				FT 19/02/24 PT 04/03/24	Next available opportunity

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21	R-FP-RIFS	Radiographic Investigations in Forensic Science	Mark Viner	25	0	10	N	29/01/24	29/01/24	02/02/24	50	ICW	100				FT 04/03/24 PT 18/03/24	Next available opportunity
22	R-FP-HF	Hazardous Forensics	Matthew Healy and Mike Harris	25	0	10	N	11/03/24	11/03/24	15/03/24	50	ICW	100				FT 15/04/24 PT 29/04/24	Next available opportunity
23	R-FP-FEAI	Forensic Exploitation and Intelligence	Stephen Johnson	28	0	10	Y	22/01/24	22/01/24	26/01/24	50	ICW	100				FT 26/02/24 PT 11/03/24	Next available opportunity
24	R-FP-CEDC	Counter-Improvised Explosive Devices Capability	Mike Harris	28	0	10	Y	18/03/24	18/03/24	22/03/24	50	IPRES	100				Presentation submission date ALL:22/04/24 Oral presentation dates: 7th and 8th May 2024	Next available opportunity
25	R-FP-ISI	Introduction to Shock and	Erik Pickering and Richard Critchley	32	0	10	N	08/01/24	08/01/24	12/01/24	50	ICW	100				FT 12/02/24 PT 26/02/24	Next available

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		Impact Modelling																opportunity
26	R-FP-BIP	Ballistic Impact Protection	Rachael Hazael and Kate Hewins	27	0	10	N	15/04/24	15/04/24	19/04/24	50	OR	100				FT PT 13/05/2024	Next available opportunity
27	R-FP-EES	Explosive Effects on Structures	Richard Critchley and Rachael Hazael	31	0	10	N	26/02/24	26/02/24	01/03/24	50	ICW	100				FT 02/04/24 PT 08/04/24	Next available opportunity
28	R-FP-UKHC	Investigating Threats to Cultural Heritage	Peter Campbell	22	0	10	N	04/12/23	04/12/23	08/12/23	50	ICW	100				FT 22/01/24 PT 05/02/24	Next available opportunity
29	R-FP-UKHE	Field Methods in Heritage Crime Investigation	Peter Campbell	22	0	10	N	12/02/24	12/02/24	16/02/24	50	ICW	100				FT 18/03/24 PT 02/04/24	Next available opportunity
30	R-FP-IHC	International Crimes Against Cultural Heritage	Peter Campbell	22	0	10	N	04/03/24	04/03/24	08/03/24	50	ICW	100				FT 08/04/24 PT 22/04/24	Next available opportunity

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32	R-FP-MFA	Materials Failure and Analysis	Jonathan Painter	32	0	10		12/02/24	12/02/24	16/02/24	50	ICW	100				FT 18/03/24 PT 02/04/24	Next available opportunity
33	R-FP-TWE	Trauma Weapon Effects	Nick Marquez Grant and Richard Critchley	32	0	10		29/01/24	29/01/24	02/02/24	50	IPRES	100				FT 04/03/24 PT 11/03/24	Next available opportunity
34	R-FP-IFI	Introduction to Fire Investigation	Mike Moulden	32	0	10	Y	04/12/23	04/12/23	08/12/23	50	ICW	100				FT 22/01/24 PT 05/02/24	Next available opportunity
35	R-FP-FENG	Fire Engineering	Mike Moulden	32	0	10	N	29/01/24	29/01/24	02/02/24	50	ICW	100				FT 04/03/24 PT 18/03/24	Next available opportunity
36	R-FP-AEC	Advanced Crime Scene Investigation	Hannah Moore	30	0	10	N	08/04/24	08/04/24	12/04/24	50	ICW	100				FT 13/05/24 PT 28/05/24	Next available opportunity
37	R-FP-DSF	Digital Scene Forensics	Graeme Horsman	20	0	10	Y	12/02/24	12/02/24	16/02/24	50	ICW	100				FT 18/03/24 PT 02/04/24	Next available opportunity

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38	R-FP-DNA	DNA	Laura Hugh	32	0	10	N	27/11/23	27/11/23	01/12/23	50	IPRES	100				FT 09/01/24 PT 23/01/24	Next available opportunity
39	R-FP-BF	Body Fluids	Laura Hugh	32	0	10	N	18/03/24	18/03/24	22/03/24	50	ICW	100				FT 22/04/24 PT 07/05/24	Next available opportunity
40	R-FP-BPA	Bloodstain Pattern Analysis	Laura Hugh	32	0	10	N	22/01/24	22/01/24	26/01/24	50	ICW	100				FT 26/02/24 PT 11/03/24	Next available opportunity
41	R-FP-TMO	Temporary Mortuary Operations	Roland Wessling and Mark Viner	28	0	10	N	13/05/24	13/05/24	17/05/24	50	IPRES	100				FT 08/07/24 PT 22/07/24	Next available opportunity
42	R-FP-FIM	Forensic Imaging	Roland Wessling and Stephanie Giles	28	0	10	N	15/01/24	15/01/24	19/01/24	50	ICW	100				FT 19/02/24 PT 04/03/24	Next available opportunity

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								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[14] - 40% or [illegible]	Type of Assessment	Weighting within module[15] (%) of Independent assessments	Weighting within module of multi-part	Type of Assessment	Weighting of individual elements of multi-part assessment[17]	Assessment Submission and/or exam date[18]	Assessment / Exam Retake date
43	R-FP-THESIS (A23) FT	Thesis	Stephanie Giles and Andrew Shortland	50	0	80	N	29/01/24	29/01/24	23/08/24	50	THESIS Oral	80 20				23/08/24 (Orals 08-12/07/24)	N/A

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours[12]	Total hours delivered by Visiting	Credits	Is the module shared? Y/N	Calendar				Assessment						
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[14] - 40% or [illegible]	Type of Assessment	Weighting within module[15] (%) of Independent assessments	Weighting within module of multi-part	Type of Assessment	Weighting of individual elements of multi-part assessment[17]	Assessment Submission and/or exam date[18]	Assessment / Exam Retake date
43	R-FP-THESIS (B23) PT	Thesis	Stephanie Giles and Andrew Shortland					04/10/23	04/10/23	04/10/24	50	THESIS Oral	80 20				04/10/24 (ORALS 08-12/07/24)	
43	R-FP-THESIS (C23) PT	Thesis	Stephanie Giles and Andrew Shortland					25/03/24	25/03/24	26/03/25	50	THESIS Oral	80 20				28/03/25 (ORAL 08-12/07/24)	
43	R-FP-THESIS (B24) PT	Thesis	Stephanie Giles and Andrew Shortland					04/10/24	04/10/24	04/10/25	50	THESIS Oral	80 20				03/10/25 07-11/07/25 (exact dates TBC)	
43	R-FP-THESIS (C24) PT	Thesis	Stephanie Giles and Andrew Shortland					24/03/25	24/03/25	23/03/26	50	THESIS Oral	80 20				24/03/26 09-13/07/26 (exact dates TBC)	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader	Contact hours[12]	Total hours delivered by Visiting	Credits	Is the module shared? Y/N	Calendar				Assessment						
												Independent Assessment		Multi-part Assessment			Submission dates	
								Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[14] - 40% or [illegible]	Type of Assessment	Weighting within module[15] (%) of Independent assessments	Weighting within module of multi-part	Type of Assessment	Weighting of individual elements of multi-part assessment[17]	Assessment Submission and/or exam date[18]	Assessment / Exam Retake date
43	R-FP-THESIS (B25) PT	Thesis	Stephanie Giles and Andrew Shortland					02/10/25	02/10/25	01/10/26	50	THESIS Oral	80 20				02/10/26 06-16/07/26 (exact dates TBC)	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

	Module Type for Forensic Award Themes (C – Compulsory, E – Elective, *20 credits ** pre-requisite)									
Module	MSc Theme	Forensic Archaeology and Anthropology	Forensic Ballistics	Forensic Investigation	Forensic Explosives and Explosion Investigation	Investigation of Heritage Crime)	Forensic Biology		Marketed as short course	Joint with another MSc
1	IS	C	C	C	C	C	C			Counterterrorism, Counterterrorism Risk Management and Resilience, *Shared elements only
2	IEC	C	C	C	C	C	C		YES	Digital Forensics
3	RFS	C	C	C	C	C	C		YES	
4	AT*	C		C		E	C		YES	
5	CS	C	C	C	C	C	C			Safety and Accident Investigation, Counterterrorism, Counterterrorism Risk Management and Resilience and Digital Forensics
6	FIEED		E	E	C				YES	Defence and Security Programme

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

7	FEI		E	E	C		E		YES	
8	TE	E	E	E	E	E	E		YES	
9	MEP		C	E	E				YES	
10	IFIFB	E	C	E	E	E			YES	Counterterrorism, Defence and Security Programme
11	FI**		C	E	E				YES	Counterterrorism
12	FBI**		C	E	E				YES	
13	FARBR	C	E	E	E	E			YES	
14	FAMGE	C		E			E		YES	
15	FFAO	C	E	E	E	E	E		YES	
16	FFAI**	C							YES	
17	PAE	E		E		E	E		YES	
18	MFI	E	E	E	E	E	E		YES	
19	EFS	E	E	E	E	E	E		YES	
Module	MSc Theme	Forensic Archaeology and Anthropology	Forensic Ballistics	Forensic Investigation	Forensic Explosives and Explosion Investigation	Investigation of Heritage Crime	Forensic Biology		Marketed as short course	Joint with another MSc
20	FF	E	E	E	E	C	E		YES	
21	RIFS	E	E	E	E	E	E		YES	
22	HF	E	E	E	E	E			YES	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

23	FEAI	E	E	E	E	E			YES	Counterterrorism, Counterterrorism Risk Management and Resilience
Module	MSc Theme	Forensic Archaeology and Anthropology	Forensic Ballistics	Forensic Investigation	Forensic Explosives and Explosion Investigation	Investigation of Heritage Crime	Forensic Biology		Marketed as short course	Joint with another MSc
24	CEDC		E	E	C	E			YES	Explosive Ordnance and Engineering, Counterterrorism, Counterterrorism Risk Management and Resilience
25	ISI		C		C	E			YES	
26	BIP		C		C				YES	
27	EES		E		C	E			YES	
28	UKHC	E	E	E	E	C			YES	
29	UKHE	E	E	E	E	C			YES	
30	IHC	E	E	E	E	C			YES	
32	MFA**		E	E	E				NO	
33	TWE	E	E	E	E		E		YES	Counterterrorism, Counterterrorism Risk
34	IFI	E	E	E	E	E	E		YES	Counterterrorism
35	FENG		E	E	E		E		YES	

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

36	AEC			C				YES	YES	
37	DSF	E	E	E	E	E	E	YES	YES	
38	DNA**	E	E	E	E	E	C		YES	
39	BF**						C		YES	
40	BPA**	E	E	E	E		C		YES	
41	TMO	E	E	E	E	E	E		YES	
42	FIM	E	E	E	E	E	E		YES	
43	Thesis - FP	C	C	C	C	C	C		NO	

**Due to the content of the module, IFIFB (10) is a prerequisite for FI (11)
**Due to the content of the module, FI (11) is a prerequisite for FBI (12)
** Due to the content of the module, FFAO (15) is a prerequisite for FFAI (16)
**Due to the content of the module, IHC (30) is a prerequisite for IHE (31)
**Due to the content of the module, UKHC (28) is a prerequisite for UKHE (29)
**Due to the content of the module, ISI (25) is a prerequisite for EES (27)
**Due to the content of the module, ISI (25) is a pre-requisite for BIP (26)
**Due to the content of the module, DNA (38) is a pre-requisite for BPA (40)
**Due to the content of the module, BPA (40) is a pre-requisite for BF (39)
** Due to the content of the module, MEP (9) is a pre requisite for MFA (32)
**Due to the content of the module IFI (34) is a pre-requisite for FENG (35)
**Due to the content of the module FENG (35) is a pre-requisite for FEI (7)(for Forensic Investigation and Forensic Ballistics)
** Due to the content of the module IEC (2) is a pre-requisite for AEC (36)

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Please list all modules that are used by another existing course.

Module code	**Module title**	**Course that owns the module**	**Other course(s)/ programme(s) that use the module**
R-FP-IS	Introductory Studies	Forensic Programme	Counterterrorism Programme
R-FP-IEC	Investigation and Evidence Collection	Forensic Programme	Digital Forensics
R-FP-CS	Courtroom Skills	Forensic Programme	Counterterrorism Programme, Safety and Accident Investigation, Digital Forensics
R-FP-FIEED	Forensic Investigation of Explosives and Explosive Devices	Forensic Programme	Defence and Security Programme
R-FP-IFI	Introduction to Fire investigation	Forensic Programme	Counterterrorism
R-FP-IFIFB	Introduction to Firearms Investigations and Forensic Ballistics	Forensic Programme	Defence and Security Programme Counterterrorism
R-FP-CEDC	Counter-Improvised Explosive Devices Capability	Forensic Programme	Explosives Ordnance Engineering Counterterrorism Programme Counterterrorism Risk Management and Resilience
R-FP-FI	Firearms Investigations	Forensic Programme	Counterterrorism
R-FP-FEAI	Forensic Exploitation and Intelligence	Forensic Programme	Counterterrorism Programme
R-FP-TWE	Trauma Weapon Effects	Forensic Programme	Counterterrorism Programme Counterterrorism Risk Management and Resilience

8. How are the ILOs assessed?

The assessment of candidates is based upon a combination of examinations, coursework assignments and, for masters' course students, the research-based dissertation:

- For the PgCert, a balance of assignments and examinations is designed to assess underlying principles and applications within the forensic environment and an ability to acquire and use information in that context.
- In the PgDip, the emphasis develops into a greater depth of analysis of role specific issues. Focus is on best practice and awareness of current research in that particular field. Students are expected to take on a professional role and assessments involve critical evaluation and professional judgement through a balance of report writing (including expert witness statements, analytical reports, and critical reviews) oral examinations (individual and group presentations) and written examinations.

To complete the course to the award of a Masters level qualification, students must progress through PgCert and PgDip modules and assessment to the final element of the programme, the research based dissertation. Students must pass this final element of the programme with a minimum mark of 50%. The practical nature of the course requires that this should normally be based on an experimental investigation and should be appropriate for the scope of the dominant theme established in the taught phase.
A variety of different types of coursework are used to assess different aspects of the student's knowledge and ability. Conventional essay work is used to test research skills and analytical ability and is often based on a critical review of the literature. A wide range of data types and sources are used. While journals, conference papers and specialist textbooks are most frequently used, students are expected to use other sources such as government publications, newspapers, television and internet sites when appropriate. Consequently, students have to demonstrate an awareness of the reliability of the source and the possibility of conflicting interests. Professional skills are developed through writing analytical reports on case studies and practical work, with a particular emphasis on clear but concise presentation. Students can expect assessed coursework to be returned to them no longer than 20 working days following the deadline for handing in, according to university regulations.

Throughout the course both individual and group presentations and briefings are used to assess communication skills appropriate for a range of target audiences. The first presentation is made in groups, as this is particularly valuable for instilling confidence and assessing an individual's ability to work within a team. However, each member is expected to clearly demonstrate his or her individual contribution and partake in the presentation.

All forensic computing modules require a coursework assignment based on an essay, a practical forensic examination or experimentation. The Forensic Computing Foundations module requires two such assignments. Most forensic computing modules also have a written examination either theory, practical or a combination of the two.

Assessment and ILO Mapping

Complete the grid below by inserting in the boxes which assessments from the modules directly assess the Award ILOs.

A. Postgraduate Certificate and Postgraduate Diploma

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	***ILO 1.***	***ILO 2.***	***ILO 3.***	***ILO 4.***	***ILO 5.***	***ILO 6.***	***ILO 7.***	***ILO 8.***
1								
2	IPRES	IPRES		IPRES	IPRES	IPRES	IPRES	
3	EX		EX		EX			
4	ICW	ICW	ICW	ICW	ICW	ICW		
5	ICW			ICW OR	ICW OR	ICW		
6	ICW	ICW		ICW	ICW			ICW
7		ICW		ICW			ICW	ICW

8	ICW	ICW	ICW	ICW			ICW	
9		ICW				ICW		
10	ICW	ICW			ICW	ICW	ICW	
11	ICW	ICW		ICW	ICW	ICW		
12	ICW	ICW	ICW			ICW		ICW
13	ICW	ICW					ICW	ICW
14	ICW					ICW	ICW	ICW
15	ICW							ICW
16	EX							EX
17	ICW			ICW	ICW	ICW		
18	ICW			ICW		ICW		ICW
19	ICW		ICW	ICW			ICW	
20	ICW	ICW	ICW		ICW			
21	ICW	ICW		ICW	ICW	ICW		ICW
22	ICW		ICW	ICW	ICW	ICW		ICW
23			ICW		ICW	ICW		ICW
24		IPRES		IPRES	IPRES	IPRES		IPRES
25		ICW	ICW		ICW	ICW		ICW
26	OR	OR	OR		OR	OR	OR	OR
27	ICW	ICW	ICW		ICW	ICW		ICW
28	ICW	ICW			ICW	ICW		ICW
29	ICW	ICW	ICW	ICW				ICW
30	ICW	ICW			ICW	ICW		ICW
31	ICW	ICW	ICW	ICW				ICW
32	ICW				ICW	ICW		ICW
33	IPRES	IPRES			IPRES	IPRES	IPRES	IPRES
34	ICW		ICW		ICW	ICW		ICW
35	ICW	ICW		ICW		ICW		ICW
36	ICW	ICW		ICW		ICW		
37	ICW			ICW		ICW		
38	IPRES	IPRES	IPRES		IPRES	IPRES	IPRES	
39	ICW	ICW			ICW		ICW	
40	ICW		ICW	ICW	ICW	ICW	ICW	ICW
41	IPRES			IPRES	IPRES	IPRES	IPRES	IPRES
42	ICW				ICW	ICW		ICW

B. MSc

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs Module No.	***ILO 1.***	***ILO 2.***	***ILO 3.***	***ILO4***	***ILO5***	***ILO6***	***ILO7***	***ILO8***	***ILO9***	***ILO10***
43	THESIS	THESIS	THESIS	THESIS	THESIS,	THESIS	THESIS	THESIS	THESIS	THESIS

CROSS-MODULAR ASSESSMENT (including any assessment which rests outside an individual module)

Title	**Modules Covered**	**Assessment**	
		Type	Weight (%)
NA	NA	NA	NA

9. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least 3 academic staff not associated with the proposal. The Panel may include 1 member of professional staff. Panels are supported by an appropriately trained Secretary who provides authoritative guidance on policy and procedure to the Panel. Proposals are reviewed in line with the UK Quality Code for Higher Education. New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in-depth 6-year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guiding principles to meet the Expectations and Core Practices of the UK Quality Code for Higher Education. External examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards on the basis of meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition, students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the UK Quality Code for Higher Education. The delivery of new partnership provision is ultimately approved by the Universities Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a 5-year review known as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

10. What opportunities are graduates likely to have on completing the course?

The programme offers a highly effective springboard into many career opportunities. These include employment routes to Government and non-Governmental bodies, police departments, forensic laboratories and independent forensic consultants working for insurance companies. It is also a necessary

introduction that leads into conducting research at PhD level in the subject. The Digital Forensics MSc could be an important stepping-stone to an academic career in Digital Forensics.

Specific course features that enable a high probability of employment include the growing field of digital forensics, the niche areas of ballistics and explosives, the science base of archaeology and anthropology, the interpretational and evaluation skills acquired through forensic biology and managerial roles within government laboratories.

COURSE SPECIFICATION

Cranfield University: Course Specifications

Course specifications outline the content and structure of a course leading to an award of Cranfield University. This version of the course specification has been approved by Education Committee and every effort has been made to ensure the accuracy of the information.

Date of first publication/latest revision: June 2024

1. What is the course?

Course information

Course Title	Future Food Sustainability
Course code	MSFFSFTC, MSFFSPTC, PDFFSFTC, PDFFSPTC, PCFFSFTC, PCFFSPTC
Academic Year	2023/24
Valid entry routes	MSc, PgDip, PgCert
Additional exit routes	PgDip, PgCert
Mode of delivery	Full-time, Part-time
Location(s)[1] of Study	Cranfield
School(s)	School of Water, Energy and Environment
Theme	Environment & Agrifood
Centre	Centre for Soil, Agrifood and Biosciences
Course Director	Dr Natalia Falagan Sama
Awarding Body	Cranfield University
Is this an AP Contract course?[2]	No
Is this course offered as a Cranfield Mastership?	No
Apprenticeship Standard the course is mapped to	N/A
Is the Degree apprenticeship integrated or non-integrated?	N/A

[1] If any part of this course is delivered at another site, please note which one(s) here
[2] AP Contract courses are provided by Cranfield University to the MoD as part of the Academic Provider contract

Is the Mastership offered as an open and/or closed course?	N/A
Teaching Institution	Cranfield University
Admissions body	Cranfield University
Entry requirements	Candidates must normally possess, or be expected to achieve, a 1st or 2nd class UK Honours degree in a relevant science or social science-based discipline, or the international equivalent of these UK qualifications. Other relevant qualifications together with industrial experience may be considered. International students will need to provide evidence that they have achieved a satisfactory test result in an English qualification. The minimum standard expected is as follows: IELTS - 6.5, TOEFL – 92, Pearson PTE Academic – 65, Cambridge English Scale – 180, Cambridge English: Advanced – C, Cambridge English: Proficiency - C.
UK Qualifications Framework Level	QAA FHEQ Level 7 (Masters)
Benchmark Statement(s)	**N/A**
Registration Period(s) available	Full-time MSc - one year, Part-time MSc - up to three years, Full-time PgCert - one year, Part-time PgCert - two years, Full-time PgDip - one year, Part-time PgDip - two years
Course Start Month(s)	Full-time: October Part-time: Throughout the year,normally an October start

Institutions delivering the course

This course is mainly delivered by the Cranfield Centre of Soil, Agrifood and Biosciences (SABS) in collaboration with other Cranfield University schools and institutes: The Centre for Environmental , Cranfield Water Science Institute and the Cranfield School of Management where the research interests include:

Soil health, food production, postharvest management, food safety, plant genetics, strategic thinking, agricultural informatics, food chain logistics, water usage and supply chain management.

Cranfield University remains fully responsible for the quality of the delivery of the course.

Accreditation by Public, Statutory or Regulatory Bodies (PSRBs)
This course is accredited by the Institution of Agricultural Engineers (IAgrE).

2. What are the aims of the course?

- To provide students with a critical awareness of the challenges, risks and opportunities of providing a sustainable supply of sufficient food to the world's population both now and in the future
- To develop graduates with the capacity to undertake successful technical research projects using appropriate methods of critical analysis
- To develop critical, creative and independent learners who can participate freely in the wide area of future food sustainability

This programme is intended for the following range of students:

- Graduates with honours degree or equivalent ideally in a subject related to a component of the course
- Graduates currently in employment keen to extend their qualifications or to pursue a career change
- Individuals with other qualifications but who possess considerable relevant experience

3. What should students expect to achieve in completing the course?

Award intended learning outcomes (ILOs) (skills and knowledge).

A. Postgraduate Certificate in Future Food Sustainability

In completing this course, and achieving the associated award, a diligent student should be able to:

- ILO 1. Evaluate the main principles and issues of providing a sustainable supply of sufficient food in the future.
- ILO 2. Critically appraise the scientific interventions such as crop development, water usage and soil management, in terms of their ability to mitigate against future food sustainability issues.
- ILO 3. Develop systematic and analytical skills in informatics based on the use of scientific data derived from crop development, and water and soil usage.
- ILO 4. Integrate technological and social science information and show how they can be utilised to predict future impacts.

B. Postgraduate Diploma in Future Food Sustainability

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 5. Evaluate the impact that current and emerging food production, processing, distribution and consumption practices have on environmental sustainability, using the principles of Life Cycle Assessment (LCA).
- ILO 6. Apply key aspects of supply chain management which are critical to the resilience of the global food supply network, and show how they can be used in integrated decision making.
- ILO 7. Integrate knowledge, understanding and skills from the taught modules in a real-life situation to address problems faced by clients, creating new problem diagnoses, designs, or system insights; and communicating findings in a professional manner in written, oral and visual forms.

C. MSc in Future Food Sustainability

In addition to the intended learning outcomes outlined above, a diligent student would also be expected to:

- ILO 8. Define a research question, develop aim(s) and objectives, select and execute a methodology, analyse data, evaluate findings critically and draw justifiable conclusions, demonstrating self-direction and originality of thought.
- ILO 9. To communicate their individual research via a thesis and in an oral presentation in a style suitable for academic and professional audiences.

4. How is the course taught?

The MSc course is taught in three sections: taught modules, a group project, and an individual research project.

- The taught programme, typically delivered between October and February, comprises a structured sequence of modules, each containing a series of lectures and other classroom-based teaching, supplemented by practical work. Eight taught modules are assessed by assignments. Each module is taught over one week, followed by a week largely free of structured teaching to allow time for more independent learning and reflection, and completion of the module assignment.

- The Group Projects are group-based research programs typically undertaken between February and April. The projects are designed to integrate knowledge, understanding and skills from the taught modules in a real-life situation.

- The thesis project, typically delivered between May and September, further develops research and project management skills that: provide the ability to think and work in an original way; contribute to knowledge; overcome genuine problems; and communicate through an individual Thesis and oral exam. Each student is allocated a supervisor, who will guide and assess the student work. Guidance sessions are provided as to what is required from the Thesis and oral presentation.

Within the induction week, students will be introduced to personal development planning and asked to reflect on their transferable skills and to take ownership of their personal development during the course. In addition, students carry out a reflective review exercise during their Group Project where they reflect on PDP objectives set in the Group Project.

5. What do students need to achieve in order to graduate?

Notwithstanding University Regulations and the authorities and powers exercised by examiners, students will normally need to demonstrate achievement in the elements of the course, as laid out in Section 8. Courses are structured through the accumulation of credit, where 1 credit represents 10 notional learning hours.

In brief, students will normally need to achieve the following in order to be awarded the qualifications:

A. Postgraduate Certificate

The accumulation of 60 credits through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Induction Module	0
Principles of Sustainability	10
Technologies for Seeds and Crop Protection	10
Soil Systems	10
Agricultural Informatics	10
Water and Sustainable Agrifood Systems	10
Strategic Foresight	10
ELECTIVE MODULES:	
TOTAL:	60

B. Postgraduate Diploma

The accumulation of 120 credits through the assessment of taught modules as detailed below:

Description	Credits
COMPULSORY MODULES:	
Induction Module	0
Principles of Sustainability	10
Technologies for Seeds and Crop Protection	10
Soil Systems	10
Food Chain Resilience	10
Agricultural Informatics	10
Water and Sustainable Agrifood Systems	10
Sustainability and Environmental Assessment	10
Strategic Foresight	10
Group Project (Full Time Students)	40

ELECTIVE MODULES:	
Part Time Students: Group Project OR Dissertation	 40 40
TOTAL:	120

C. MSc

In addition to the requirement for the Postgraduate Diploma outlined above, students must successfully complete the thesis. An MSc will be awarded on successful completion of 200 credits as outlined below:

Description	**Credits**
COMPULSORY MODULES:	
Induction Module	0
Principles of Sustainability	10
Technologies for Seeds and Crop Protection	10
Soil Systems	10
Food Chain Resilience	10
Agricultural Informatics	10
Sustainability and Environmental Assessment	10
Water and Sustainable Agrifood Systems	10
Strategic Foresight	10
Group Project (Full Time Students)	40
Thesis	80
ELECTIVE MODULES:	
Part Time Students: Group Project OR Dissertation	 40 40
TOTAL:	200

If a student does not meet the required standards for the award, the examiners for the programme may decide to offer a lower award associated with the programme, providing that a lower exit award exists, and the student meets the requirements of that lower award.

Pass Criteria

The University operates standard pass criteria which can be found in the Senate Handbook on Assessment Rules.

In order to achieve your award, you are required to achieve:

- An overall average mark of ≥50%;
- An average mark of ≥50% across the taught assessment;
- All assessments need to be completed and the minimum mark attained: no more than one failure to complete an assessment (as defined in Section 2.3) will be permitted throughout the course of

your studies (Please note that the board of examiners does not have discretion to overrule this limit, but can refer a case to Senate's Education Committee); [3]

- **For Taught Assessments,** the minimum mark for each individual taught assessment on the first attempt for the significant majority of the taught assessments, noting that:
  - if you fail to attain the minimum mark for **up to 30 learning credits**, you will be permitted to re-take all of those assessments (except for circumstances where a resit award capped at 50% would be insufficient to achieve an overall average mark of ≥50% across the taught assessments);
  - if, having failed to attain the minimum mark for 30 learning credits, you fail to obtain the minimum mark for **any additional learning credits** over the course of your studies you will be disqualified from the right to re-take the assessments: this will normally result in intended award failure. (Please note the board of examiners may at its discretion overrule this limit, but this is not an automatic right);
  - it is not permissible for you to fail an elective module and then proceed to take a different elective module in its place.
- **For Substantial pieces of assessment** (corresponding to ≥40 credits, which are not part of the taught assessment average), the pass mark of ≥50% (where they exist);
- **For the thesis,** a mark of ≥50% in order to receive a pass (where it exists).

6. How is the course structured?

Full-time students register for the course in October and are expected to complete the course within 12 calendar months.

The course is also offered on a part-time basis and such students are expected to complete the course within 2 to 3 years. Part-time students are not restricted to starting in October. Instead, they are offered individual guidance on the best sequence of study based on their prior knowledge and availability to attend

7. Course Level Assessment Strategy[4]

All taught modules are assessed through an individual summative written assignment. Assessments are diverse in context and style in order to ensure that all the course ILOs are met but to also allow students to practise different types of writing styles (e.g., preparing a briefing document for a local council, compiling a field and laboratory data report, developing a case study, writing an essay based on scientific literature). Wherever possible, real or realistic examples are used for the assignments in order to prepare the students for the type of work they might be required to undertake when they enter the job market. Formative assessments are included in each module in the form of group and individual oral presentations. Feedback is given in a timely manner through group discussions and Q&A sessions after presentations. Written feedback is provided for all summative assessments within 20 working days.

In addition, the Group Project assessment is completed through a consultancy report for a real client and a group presentation to a wider audience. TThe submission of the thesis in the form of a scientific research paper is required for the successful completion of the individual research project component of the course, ensuring that ILOs 8 and 9 are met.

[3] Providing the minimum mark is met, a mark of 40-49% will be automatically compensated if a student's overall average taught assessment mark (including the failed assessment) is greater than 50%. Students are advised, however, that they retain the right to re-take an assessment with a mark of <40% (but should note that a re-take attempt will be capped at 50%), as long as they haven't failed more than 30 credits. At the discretion of the Board of Examiners or by Board of Examiners Chair's Actions a student may be permitted a re-take attempt of modules in the range of 40-49% only if the average mark of their other taught modules would not allow them to qualify for their award (<50%).

[4] Guidance to aid colleagues writing or updating a course-level assessment strategy for inclusion in the Course Specification can be found as Appendix K in either the Senate Handbook on Setting up a New Taught Course or the Senate Handbook on Managing Taught Courses https://intranet.cranfield.ac.uk/EducationServices/Pages/SenateHandbooksA-Z.aspx

Course modules

The following modules outline all parts of the programme leading to **MSc**. Other awards associated with the course include some or all of these modules.

Module Number	Module code	Title	Module Leader		Contact hours[5]	Total hours delivered by Visiting Lecturers[6]	Credits	Is the module shared? Y/N	Calendar			Assessment							
													Independent Assessment		Multi-part Assessment			Submission dates	
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[7] - 40% or 50%	Type of Assessment	Weighting within module[8] (%) of Independent assessments	Weighting within module of multi-part assessments[9](100%)	Type of Assessment	Weighting of individual elements of multi-part assessment[10]	Assessment Submission and/or exam date[11]	Assessment / Exam Retake date
1	I-AGF-INWK	Induction Week	Sofia Kourmpeti		33		0	Y		02/10/23	06/10/23	N/A	AO	N/A				N/A	N/A
2	I-EMB-A1122	Principles of Sustainability	Paul Burgess		26		10	Y		09/10/23	20/10/23	40	ICW	100				FT 21/10/23 PT 04/11/23	05/24
3	I-FFS-PBT	Technologies for Seeds and Crop Protection	Zoltan Kevei		20	2	10	N		23/10/23	03/11/23	40	ICW	100				FT 04/11/23 PT 18/11/23	05/24

[5] Please note that all contact hours are indicative and represent scheduled teaching, which is subject to minor changes and variation at short notice
[6] Visiting Lecturer = a member of staff (with RTS) but not on a permanent contract (does not include those acting as occasional guest speakers)
[7] A mark of 50% is required to pass the assessment however, where the stated minimum mark is 40%, a mark of 40-49% may be compensated by good performance in other modules providing that the overall average is ≥50%.
[8] For **independent assessments** please record type and weighting of each separate piece of assessment individually. 10 credit modules should be designed to allow assessment through a single independent summative assessment. Deviations will require approval by the School Director of Education
[9] For **multi-part assessments** please record the overall weighting of module which should be 100%. Multipart assessments should only be included in courses where there is a clear androgogical reason and where each element forms part of a continuous learning and assessment experience for students.
[10] Failure to submit an element of a **multi-part assessment** will **not** require remedial action if the absence of the marks for the assignment still results in a pass for the assessment (whether 40 or 50% as appropriate*).* If, however, the absence of marks fails to meet the minimum mark for the module then **all** elements of the assessment must be re-taken.
[11] Please ensure you include submission dates for both FT and PT students and that you give details of the submission date for each individual element of a multi-part assessment.

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader		Contact hours[5]	Total hours delivered by Visiting Lecturers[6]	Credits	Is the module shared? Y/N	Calendar			Assessment							
													Independent Assessment		Multi-part Assessment			Submission dates	
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[7] - 40% or 50%	Type of Assessment	Weighting within module[8] (%) of Independent assessments	Weighting within module of multi-part assessments [9](100%)	Type of Assessment	Weighting of individual elements of multi-part assessment[10]	Assessment Submission and/or exam date[11]	Assessment / Exam Retake date
4	I-LAM-A1138	Soil Systems	Jacqueline Hannam		34		10	N		06/11/23	17/11/23	40	ICW	100				FT 18/11/23 PT 02/12/23	05/24
5	I-FFS-FCR	Food Chain Resilience	Abhi Ghadge		25		10	Y		20/11/23	01/12/23	40	ICW	100				FT 02/12/23 PT 06/01/24	05/24
6	I-FFS-AI	Agricultural Informatics	Toby Waine		40		10	N		04/12/23	15/12/23	40	ICW	100				FT 06/01/24 PT 20/01/24	05/24
7	N-ACE-SEA	Sustainability and Environmental Assessment	Gill Drew		25	2	10	Y		08/01/24	19/01/24	40	ICW	100				FT 20/01/24 PT 03/02/24	05/24
8	I-FFS-WSS	Water and Sustainable Agrifood Systems	TBC		30		10	N		22/01/24	02/02/24	40	ICW	100				FT 03/02/24 PT 17/02/24	05/24

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Module Number	Module code	Title	Module Leader		Contact hours[5]	Total hours delivered by Visiting Lecturers[6]	Credits	Is the module shared? Y/N	Calendar			Assessment							
													Independent Assessment		Multi-part Assessment			Submission dates	
									Module Start Date (eg Pre-course task)	Module Delivery Start Date	Module Delivery End Date	Minimum Mark[7] - 40% or 50%	Type of Assessment	Weighting within module[8] (%) of Independent assessments	Weighting within module of multi-part assessments [9](100%)	Type of Assessment	Weighting of individual elements of multi-part assessment[10]	Assessment Submission and/or exam date[11]	Assessment / Exam Retake date
9	I-EMB-A1005	Strategic Foresight	Kenisha Garnett		30		10	Y		05/02/24	16/02/24	40	ICW	100				FT 17/02/24 PT 02/03/24	05/24
10	I-SWEE-GRPP	Group Project	Jitka MacAdams		16		40	Y		26/02/24	03/05/24	50 50 50 50	GCW GPRES ICW RP	64 16 10 10				26/04/24 @ 16.00 23/04/24 @ 16.00 03/05/24 04/05/24 @ 23:59	
11	I-SWEE-DISS	Dissertation in place of group project for part time students	Jitka MacAdams		10		40	Y		26/02/24	20/09/24	50 50	IPROJ IPRES	80 20				20/09/24 wc 23/09/24	SEPT 25
12	I-SWEE-THES	Thesis Project	Jitka MacAdams		20		80	Y		07/05/24	07/09/24	50	THESIS OR	90 10				02/09/24 @ 16.00 W/C 27/08/24-04/09/2024	SEPT 25

Assessment Types: AO – Attendance only; ICW – Individual Coursework; GCW – Group Coursework; IPRES – Individual Presentation; GPRES – Group Presentation; IPRAC – Individual Practical; GPRAC – Group Practical; IPROJ – Individual Project (>20 credits); GPROJ – Group Project (>20 credits); EX – Examination ; RP – Reflective Portfolio; OR- Viva Voce examination; THESIS – Thesis; MULTI – Multi-part Assessment

Please list all modules that are used by another existing course.

Module code	**Module title**	**Course that owns the module**	**Other course(s)/ programme(s) that use the module**
I-AGF-INWK	Induction week	Applied Bioinformatics	All SWEE courses
I-EMB-A1122	Principles of Sustainability	Environmental Management for Business	Future Food Sustainability Sustainability Level 7 Apprenticeship
I-EMB-A1005	Strategic Foresight	Environmental Management for Business	Future Food Sustainability
N-ACE-SEA	Sustainability and Environmental Assessment	Renewable Energy Management	Future Food Sustainability Global Environmental Change Renewable Energy Management Environmental Management for Business Environmental Engineering (Jiangsu) Sustainability Level 7 Apprenticeship
I-FFS-FCR	Food Chain Resilience	Future Food Sustainability	Food Systems and Management
I-SWEE-GRPP	Group Project	Advanced Water Management	All SWEE courses
I-SWEE-DISS	Dissertation in place of group project for part time students	Advanced Water Management	All SWEE courses
I-SWEE-THES	Thesis Project	Advanced Water Management	All SWEE courses

8. How are the ILOs assessed?

The following assessment types are utilised:

The taught modules are assessed by in-module assessment (including a mix of summative and formative coursework, which focuses on application of principles studied and underpinning knowledge). In addition, the Group Project for full-time students is assessed by two written reports and an oral presentation. The performance of each student in the group to work individually and as part of a team is assessed by means of one of the written reports, which is a reflective review. The dissertation for part-time students is based on a review of available information including academic literature, presentation of ideas and analysis and the development of conclusions.

Assessment and ILO Mapping

A. Postgraduate Certificate

Award ILOs / Module No.	ILO 1	ILO 2	ILO 3	ILO 4
2	ICW			ICW
3	ICW	ICW		
4	ICW	ICW		
6			ICW	
8	ICW	ICW		
9	ICW			ICW

B. Postgraduate Diploma

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs / Module No.	ILO 5	ILO 6	ILO 7
5		ICW	
7	ICW		
10			GPROJ GCW ICW RP
11			IPROJ IPRES

C. MSc

In addition to those outlined above, the Award intended learning outcomes are assessed by the following module assessments:

Award ILOs / Module No.	ILO 8	1LO 9
12	THESIS/ OR	THESIS/ OR

CROSS-MODULAR ASSESSMENT

Title	Modules Covered	Assessment	
		Type	Weight (%)

9. How will the University assure the quality of the provision?

New course proposals are reviewed by a Course Validation Panel, comprising at least the following membership: normally one subject matter expert external to the School or University, at least three academic staff not associated with the proposal. The Panel may include one member of professional staff. Panels are supported by an appropriately trained Secretary who provides authoritative guidance on policy and procedure to the Panel. Proposals are reviewed in line with the UK Quality Code for Higher Education. New courses are ultimately approved by the University's Education Committee, on behalf of Senate.

Course changes are approved by the School's Director of Education on behalf of Education Committee and Senate. Significant changes to a course will be referred to a Course Review Panel at the discretion of the Director of Education.

The University has in place regular monitoring procedures for quality assurance including an Annual Reflective Review for each course and an in depth six-year review of each School's (total) educational provision known as the Senate Review.

Each course has at least one External Examiner who monitors all aspects of the assessment process. This is in line with the guiding principles to meet the Expectations and Core Practices of the UK Quality Code for Higher Education. External examining is one of the principal means for maintaining UK threshold academic standards within autonomous higher education institutions.

Each course has a formally constituted Examination Board, which includes the External Examiner, and which is responsible for ensuring that awards are made within the Regulations of the University and that students are made awards based on meeting the specified Intended Learning Outcomes of a course at the appropriate standard.

Each course has a formally constituted Course Committee which meets at least twice a year to discuss, inter alia, programme design and planning, the student experience (including feedback) and student progress.

Each course has an Industry Advisory Panel (or similar) which meets at least once a year to engage with external stakeholders on curriculum design and currency of course content.

Student feedback both qualitative and quantitative is collected for each module studied. In addition, students are invited to participate in the University's annual New Student Survey and Student Satisfaction Survey along with the annual national Postgraduate Taught Student Experience Survey. The results of all feedback are considered by the Course Committee and additionally, in respect of the University and national surveys, issues of quality are considered by and acted on where appropriate by the Education Committee, Senate, School and University Executives.

New Partnership arrangements are considered in two stages:

1. The University Executive is responsible for ensuring appropriate due diligence has been undertaken in respect of the University's legal, financial, reputational, and ethical responsibilities.
2. A Partnership Delivery Approval Panel then considers whether the proposal meets the UK Quality Code for Higher Education. The delivery of new partnership provision is approved by the Universities Education Committee, on behalf of Senate.

Year one partnership reviews are undertaken one year after the initiation of a new partnership involving academic (award bearing) provision. The aim is to provide a supportive framework to assist the Sponsoring School and its new Partner Institution to work collaboratively to ensure that: the learning and teaching provision and associated student experiences are of a high standard; and that those responsible for delivering the provision are undertaking their respective roles and responsibilities in an appropriate way.

As part of the regular monitoring procedures for established collaborative partnerships, in addition to the Annual Reflective Review there is an Annual Operating Statement and a five-year review known

as a Focused Review which looks at each partnership in depth. Occasional site inspection visits are also made.

10. What opportunities are graduates likely to have on completing the course?

This course is part of the Agrifood teaching Programme within CSAFI and, makes use of relevant links with industry that have previously been developed through research or teaching activities. This is anticipated to include employment opportunities for suitable graduates. Some of the employers over the last three years include:

- Kellogg's
- Carlsberg Group
- Deloitte
- Food Experts SL

On completion, graduates also have a broad network of global contacts, and increased opportunities for individual specialism in their chosen careers by making use of Cranfield Alumnus Society